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REVIEW



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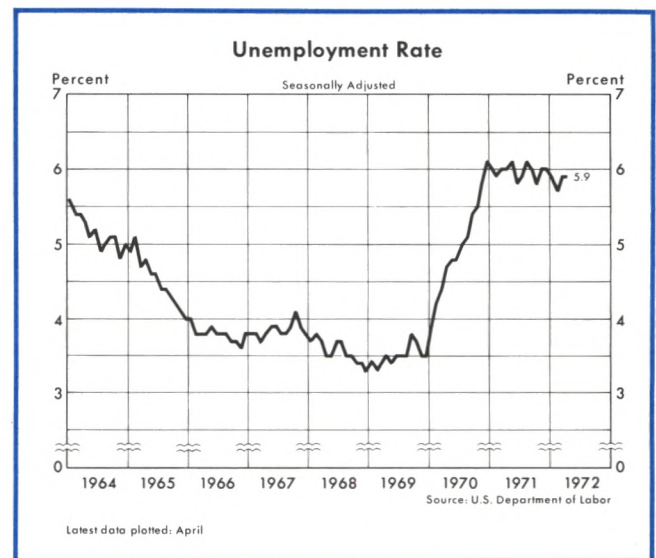
Curbing Price Expectations: The Key to Inflation Control

by ROGER W. SPENCER and DENIS S. KARNOSKY

THE PERIOD since 1969 has proven to be a difficult one for monetary and fiscal stabilization authorities. The rate of inflation has been quite resistant to attack—prices continue to rise rapidly even now, more than three years after the Government initiated its battle against inflation. Moreover, the slowing of aggregate demand in 1970 had only a moderate impact on inflationary pressures, while generating substantial increases in unemployment. High rates of unemployment have persisted since early 1970.

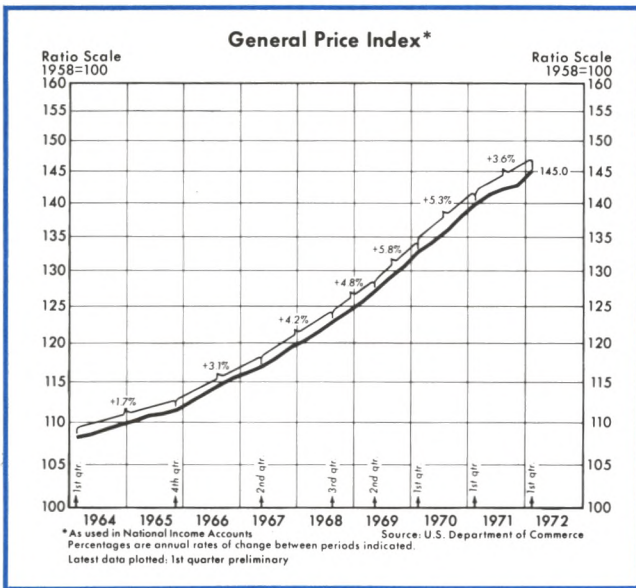
Much of the basis for the stabilization actions taken to curb inflation, such as the 1968 tax surcharge and a concurrent slowing in Government expenditures, was predicated on a view of aggregate economic behavior which evolved from the Great Depression of the 1930s. This view largely reflects the “standard” model of economic activity found in many basic economic textbooks. It states that prices and unemployment are determined fundamentally by the relation between aggregate demand and the level of full employment output.

In its simplest form, the standard model indicates that when the demand for goods and services falls below the level of potential output, the economic system will experience increased unemployment and the rate of increase of prices will tend to fall. This implication of the model has been refined into an hypothesis describing a trade-off between unemployment and the rate of inflation, where reductions in one are associated with predictable increases in the other—less inflation entails more unemployment and *vice versa*.



Since unemployment averaged 5.9 percent of the labor force in the six-month period ending March 1972, and the implicit GNP price deflator rose at almost a 4 percent rate over the same period, despite the imposition of price-wage controls, something was apparently amiss with this view of economic behavior. Clearly, the simultaneous occurrence of both high rates of unemployment and inflation since 1969 requires additional explanation. A logical explanation centers on price expectations, a factor generally neglected by most analysts until very recently.

The economic model developed at this Bank has, since its inception, utilized the concept of price ex-



$$\text{Consumption Demand} + \text{Investment Demand} + \text{Government Demand} = \text{Total Demand}$$

Establishing Sufficient Demand

The standard view of economic behavior, whether formalized by dozens of equations or etched on the back of an envelope in “judgmental” style, has as its basis consumption demand and investment demand. It is primarily by affecting consumer and investor spending plans that the Government attempts to influence aggregate demand and thereby affect prices and unemployment.

Consumption – The consumption sector of the standard model places strong emphasis on income as a major determinant of consumer demand. The analysis centers on the fact that individuals can either consume or save a portion of each extra dollar of income. The more of each extra dollar of income spent on consumption, the greater the impact on total spending. The effect of increased consumer spending is then “multiplied” through the economy from individual to individual.

Historical comparisons indicate consumption spending has not been especially strong in recent years. Consumer spending relative to disposable income (the average propensity to consume) declined from an average of .92 in the 1960-65 period, to .91 in 1966-69 and .89 in 1970-71. The accompanying chart indicates

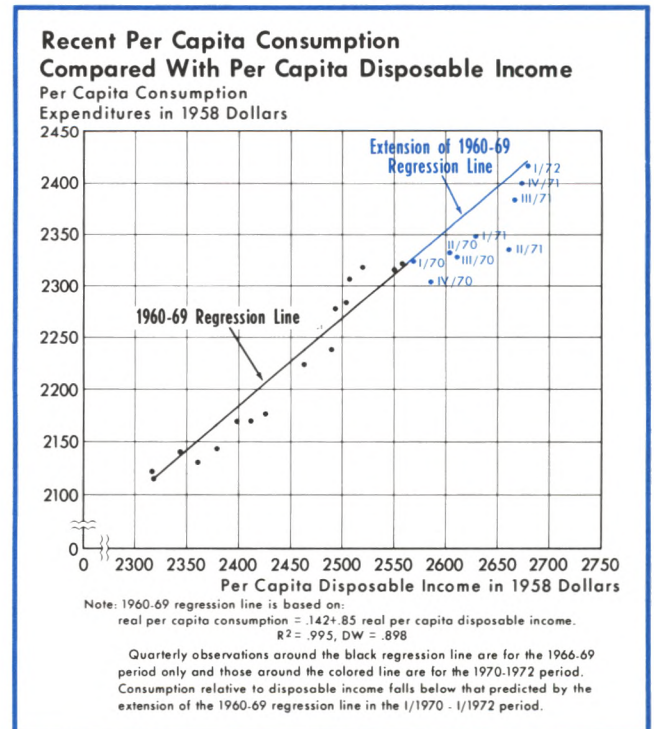
expectations as a factor influencing both prices and unemployment. This article considers the effect of market expectations in the current inflation-unemployment situation in order to point out the pitfalls connected with this phenomenon in the analysis of aggregate economic behavior. These pitfalls will be considered within the context of a fairly standard, but somewhat simplified, view of aggregate behavior. For purposes of illustration, this standard model, which until recently evidenced little concern for expectations, will be compared with the model of this Bank, which takes explicit account of price expectations.

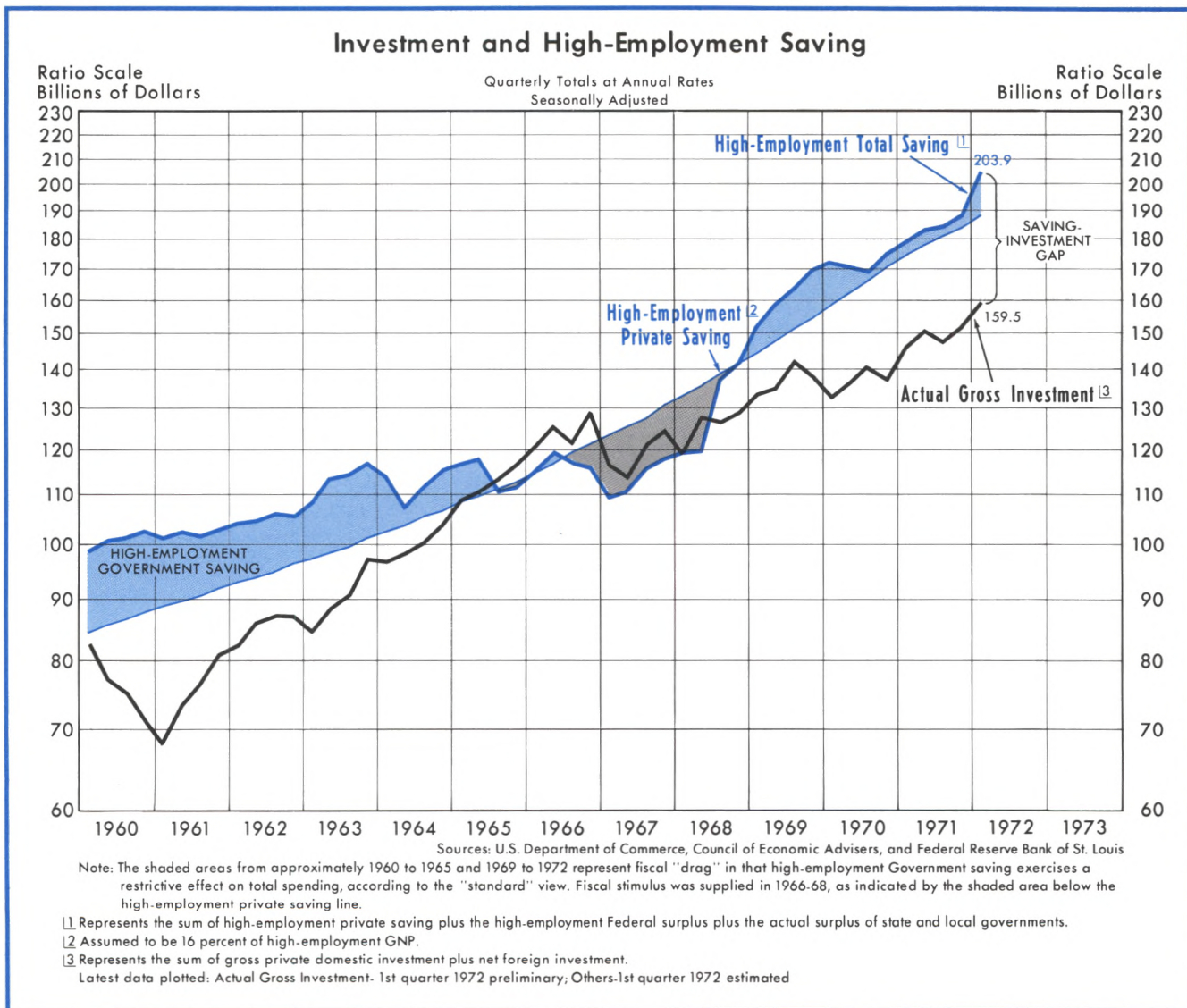
The Standard Model

The standard view of aggregate economic behavior has its origins in the 1930s, a period marked by exceptionally high rates of unemployment throughout much of the world and little or no inflation. As a consequence, the economic theories which evolved from that period were oriented toward the development of ways to generate sufficient demand to achieve full employment.¹

In addition to a concern for sufficient aggregate demand to insure full employment, the theory as developed emphasizes the short run, quantities (not prices), real variables (instead of nominal ones), and the entire demand structure of the economy as summarized by the following:

¹The subordination of prices to employment (or real output) in the standard model is further reflected at the economic level by the absence of prices in the diagrammatic “IS-LM” version of the standard model developed in the late 1930s, and at the political level by an important Act which seeks to promote maximum employment, production and purchasing power, but is known as the Employment Act of 1946.





that real per capita consumer spending relative to real per capita disposable income was below a 1960-69 regression line over the past two years. A slowing in the rate of growth of consumer spending for non-durable goods and services has occurred since 1969. Expenditures on durable goods (in real terms) recovered strongly from the 1970 recession in 1971 and early 1972, but real consumer expenditures on non-durable goods and services (which comprise the bulk of consumer spending) have not rebounded. Thus, the lack of strength in consumer spending, has been (according to the standard view) a factor contributing to sluggish aggregate demand in recent times.

If individuals have decreased the proportion of their income they desire to spend, they must have increased, it is argued, the share they desire to save. The ratio

of saving to disposable income rose from an average of 6 percent in the 1960-69 period to an average of 8.1 percent in 1970 and 1971. A small change in the ratio entails a change of many billions of dollars into saving or consumption.

Total private saving (personal saving plus gross business saving) relative to GNP, increased from an average of 15.6 percent in 1968 to an average of 16.6 percent in 1971. Saving has also been high throughout the latest recession-recovery period compared with the 1960-61 recession-recovery period. The ratio of total private saving to GNP averaged 15 percent in 1960-61, well below the 1970-71 average of 16.2 percent.

Investment – The rise in saving has been accompanied by relatively weak investment, as the so-called

“paradox of thrift” suggests:²

An increased desire to consume—which is another way of looking at a decreased desire to save—is likely to boost business sales and increase investment. On the other hand, a decreased desire to consume—i.e., an increase in thriftiness—is likely to reduce inflationary pressures in times of booming incomes; but in time of depression, it could make the depression worse and reduce the amount of actual net capital formation in the community. *High consumption and high investment are then hand in hand rather than opposed to each other.*³

The chart on the preceding page indicates that a substantial gap between investment (gross private domestic investment plus net foreign investment) and high-employment total saving (private plus Government) opened over the past three years. Investment was still almost \$45 billion short of the level of saving estimated to occur if the economy were operating at full employment in the first quarter of 1972.

Strong residential construction investment over the past year was accompanied by gains in business fixed investment which partially offset recent setbacks in net exports and sluggish inventory accumulation. Yet, the full employment-saving analysis suggests that total investment must accelerate if full employment is to be achieved. The importance of the investment stimulus has been described by the Council of Economic Advisers:

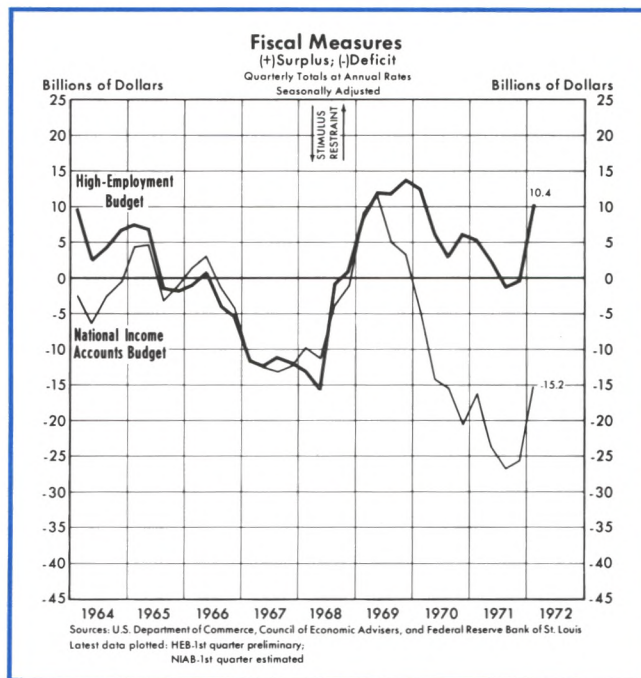
But the economy can have high employment only if actual investment demands of businesses are large enough to match the amount that consumers, businesses and governments wish to save at high employment incomes. If actual investment falls short of high-employment saving, total spending will fall short of high-employment output. Because of insufficient demand, production will be held to some lower level where a smaller volume of saving does match the forthcoming investment.⁴

Fiscal and monetary actions—The typical fiscal policy response to sluggish consumer and private investment spending is stepped-up Government spending and/or tax reductions to increase aggregate demand. Government spending adds directly to total spending while tax reductions affect consumer spending by increasing disposable income, and investment spending by increasing the after-tax return to the firm.

²The paradox is that while saving is often considered a virtue for individuals, massive saving by everyone adversely affects economic activity.

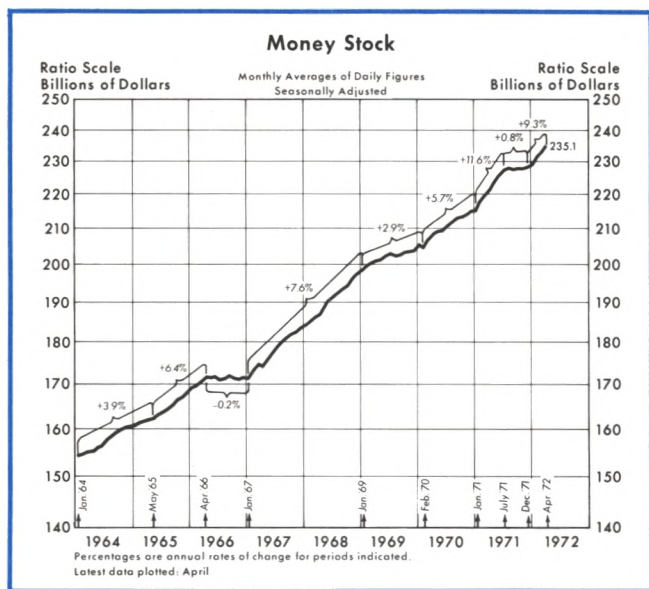
³Paul A. Samuelson, *Economics*, 8th ed. (New York: McGraw-Hill, 1970), p. 224.

⁴*Economic Report of the President* (January 1966), p. 42.



The Government adopted restrictive policies in 1968 and 1969 to slow inflation, but has since attempted to provide moderate stimulus to the economy through tax reductions and increased spending. Cutbacks in Federal defense spending about coincided with the tax surcharge of mid-1968 to swing the high-employment budget from a \$15.7 billion deficit in mid-1968 to an \$11.9 billion surplus in mid-1969. The high-employment budget remained in surplus until 1971 (declining unevenly from the large surplus in mid-1969 to balance in mid-1971). Earlier estimates of the 1972 budget, reflecting tax reductions and Government spending increases, projected a sizable high-employment deficit. Overwithholding of tax obligations, however, has led to the current projection of a \$3.5 billion high-employment surplus in fiscal year 1972 (as estimated by this Bank) and a \$4.1 billion deficit in fiscal year 1973.

The standard view recognizes that Government deficits are more effective in stimulating economic activity when accompanied by expansionary monetary actions, and Government surpluses are more effective in curbing such activity when accompanied by monetary restraint. Monetary actions were restrictive throughout most of 1969 as stabilization authorities attempted to curb inflationary pressures. Such actions became moderately expansive in 1970 and considerably more stimulative the first half of 1971, despite the fact that prices continued to rise at a rapid rate. After remaining about unchanged from July 1971 to December, money supply growth accelerated sharply to



a 9.3 percent rate from December to April 1972. Growth of total spending also increased from a 5.3 percent annual rate in third quarter 1971 to a 7.6 percent rate in fourth quarter and an 11.8 percent rate in first quarter 1972.

Aggregate Demand, Potential Output, and Inflation

The ability of the standard model to accurately project aggregate demand changes into real output and price changes was seriously overestimated in recent years. The sufficiency of aggregate demand is usually judged relative to potential output. Typically, it is presumed that strong aggregate demand relative to potential output results in low unemployment rates and considerable inflation, while weak aggregate demand relative to potential output culminates in high unemployment and near price stability.

Further, prices are normally related to unit labor costs, which comprise the major portion of business costs throughout the economy. Unit labor costs, being the ratio of the average wage rate to output per man-hour, respond positively to wage increases in excess of productivity. The unemployment rate enters the pricing process through a presumed negative effect on wage demands of workers.⁵

With its historically strong orientation toward employment considerations, it is not surprising that the standard model has come closer to capturing changes in the unemployment rate than changes in prices (see

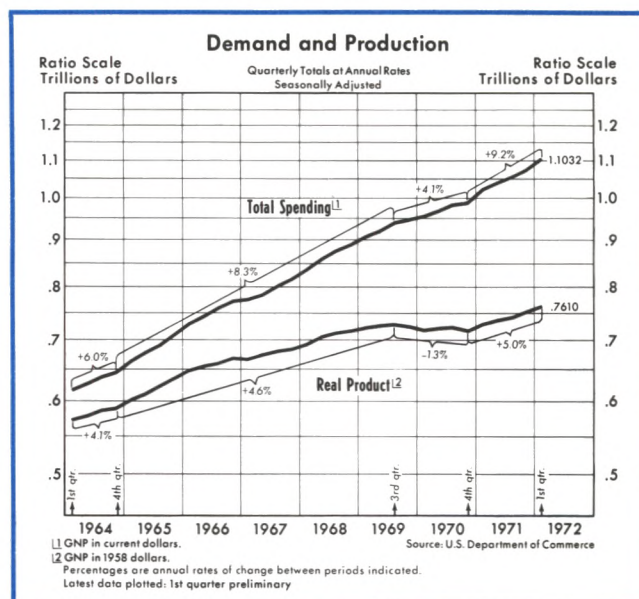


Table I) at a time when the typical Phillips curve relation has seemingly gone awry. Weak aggregate demand since 1969 has had an adverse impact on unemployment, as the standard model would suggest, but prices have continued to rise at a rapid rate. Despite price-wage controls, prices have increased only slightly less rapidly since August 1971 than before the three-month “freeze” announced last August. Much of the price slowing recorded during the freeze itself was reversed in the early months of 1972.

Wholesale prices of all commodities (seasonally adjusted) increased at a 3.1 percent rate from August 1971 to April, compared with a 4.7 percent rate from February 1971 to August; consumer prices (seasonally adjusted) rose at a 2.8 percent rate from August to March, compared with a 4.1 percent rate from February 1971 to August. The implicit GNP deflator, the broadest measure of average prices, increased at a 3.9 percent rate from third quarter 1971 to first quarter 1972, after rising at a 3.3 percent rate in the preceding two quarters.

It would appear that the continuation of inflationary pressures in the face of high rates of unemployment reflects a possible change in the determination of prices.⁶ Such a change is quite probably due to an upward shift in price expectations. Since the standard model incorporated little or no role for expectations prior to the recent inflation-recession experience, there

⁶Conditions surrounding the determination of unemployment also have probably changed over the past few years. See, for example, George L. Perry, “Labor Force Structure, Potential Output, and Productivity,” *Brookings Papers on Economic Activity* (3:1971).

⁵See Michael Evans, *Macroeconomic Activity* (New York: Harper and Row, 1969), pp. 263-74.

Table 1

The Record of Prediction

	ASA Survey ¹		Livingston Survey ²		St. Louis ³	
	Predicted	(Actual)	Predicted	(Actual)	Predicted	(Actual)
1969						
Prices ⁴	3.3%	(4.8%)	3.5%	(6.0%)	4.1%	(5.1%)
Unemployment ⁵	3.9	(3.5)	4.1	(3.6)	3.5	(3.6)
1970						
Prices	4.7	(5.5)	4.0	(5.6)	4.6	(5.7)
Unemployment	4.3	(4.9)	4.6	(5.9)	5.4	(5.9)
1971						
Prices	3.9	(4.7)	4.0	(3.3)	4.0	(3.4)
Unemployment	5.6	(5.9)	5.6	(5.9)	5.7	(5.9)

The consensus projections from the annual ASA and Livingston forecasting surveys are based predominantly on studies of forecasters who employ some form, either econometric or judgmental, of the standard model. The table indicates these forecasters and the St. Louis Bank model experienced more success in projecting unemployment rates than price increases over the past three years. The St. Louis model, which makes use of price expectations in its forecasts, has done relatively better in recent years in capturing inflationary movements in a high-unemployment economy.

Other comparisons of recent projections are given in "Has Monetarism Failed? — The Record Examined," a speech by Darryl R. Francis, this Review (March 1972), pp. 32-48.

¹ASA Survey projections are from *The American Statistician*, February 1969, February 1970, and February 1971.

²Livingston Survey projections are from J. A. Livingston, *American Banker*, December 30, 1968, December 29, 1969, and December 28, 1970.

³St. Louis predictions were made in "A Monetarist Model for Economic Stabilization," this Review (April 1970), pp. 18-19. These predictions are based on the assumption of 6 percent money growth.

⁴Rate of change of prices for the ASA Survey is the change in the GNP deflator from one calendar year to the next. Rate of change of prices for the Livingston Survey is the change in the consumer price index from December to December. St. Louis model price projections are for the GNP deflator from fourth quarter to fourth quarter.

⁵ASA unemployment projections are for the calendar year, Livingston projections are for December, and St. Louis projections are for the fourth quarter.

has been considerable effort expended to graft expectations variables somewhere onto the model.

A Model With Expectations

The economic model of the St. Louis Bank, published in April 1970, incorporated from the start a measure of price expectations as an important factor in the explanation of price changes. Prices and real output are related directly to total spending changes rather than indirectly.

Key Relations of the Model

The determination of unemployment is basically the same as in the standard view of economic behavior; that is, unemployment emerges from the relation between real and potential output. Spending is determined directly by monetary and fiscal influences rather than as the result of aggregating consumption, investment and government spending. Prices are estimated by a comparison of total spending to potential output (as with the standard model)

together with a price expectations variable.⁷ Thus, monetary and fiscal actions and the anticipation of future price changes are closely associated with current prices.

This rather small model indicated, largely because of the price expectations variable, that inflation would probably continue for some time, even after the implementation of restrictive monetary and fiscal actions in 1969.⁸ The importance of price expectations, particularly in a period such as the present, requires further elaboration. The foundation for price expectations is essentially microeconomic, resting on the individual decisions of workers and firms. Since the reasons for individual decisions are quite difficult to quantify, the following scenario of recent economic behavior is but one possible explanation of the events leading to the current high unemployment and inflation dilemma.

Expectations

The importance of expectations emerges most clearly when viewed against a background of accelerating price increases. The late 1960s were characterized by rising interest rates, rising unit labor costs, rising rental costs, rising commodity prices, low rates of unemployment, sluggish productivity and lackluster profits. These are traits typically observed near the peak of a business cycle. The expansionary phase of this cycle was, however, the longest in the post-War period. Thus, these cyclical traits at the end of the expansion of the 1960s were exceptionally strong.

The marked changes in the growth patterns of most of these indicators began in 1965 when Government defense and domestic spending demands expanded on top of strong private demands for a limited supply of goods and services. Much of the increased Government spending was accomplished through monetary expansion rather than through public purchases of

⁷See Ronald L. Teigen, "A Critical Look at Monetarist Economics," and Robert H. Rasche, "Comments on a Monetarist Approach to Demand Management," this Review (January 1972) for appraisals of recent contributions to the price expectations literature.

⁸See Leonall C. Andersen and Keith M. Carlson, "A Monetarist Model for Economic Stabilization," this Review (April 1970), p. 20.

Treasury bonds or tax increases. The money stock, which had increased at a 3 percent annual rate from 1960 to 1965, rose at a 5.1 percent rate from 1965 to 1968.

Increased demand could only be met by the additional employment of relatively inefficient capital and labor; the more efficient productive factors were already being utilized. Growth of output per man-hour, which had increased at a 4.1 percent annual rate from 1960 to late 1965, began to slow almost immediately, averaging 3.1 percent from third quarter 1965 to third quarter 1966. From 1966 to third quarter 1969, labor productivity increased at a 1.9 percent annual rate. Since profits had been strong until the period of rapid demand acceleration, firms were able to employ these additional capital and labor inputs so long as they believed the higher costs could be passed along in the form of higher prices.

Firms apparently expected their own prosperity to continue for some time and they were not especially concerned at first that accelerated wage increases and a slowing growth of productivity, due in large part to the utilization of inefficient resources, pushed up unit labor costs. The firms were able to raise their own prices since aggregate demand was continually stimulated until late 1968, but the price increases they were able to get were not sufficient to cover all of the rising costs of production. Average prices of goods and services produced in the private portion of the economy rose 2.9 percent from late 1965 to late 1967, slightly more than double the rate of increase from 1960 to 1965. From 1966 to late 1969 these prices rose at a 3.8 percent annual rate. Unit labor costs, which had increased at an annual rate of 0.4 percent from 1960 to 1965, rose 4.4 percent in the next year, and at a 5.1 percent rate from 1966 to late 1969. The acceleration of costs in excess of price increases adversely affected profit rates throughout the late 1960s.

With the restrictive fiscal and monetary policies which began in 1968, the rate of growth of aggregate demand started to fall. At first, firms did not know whether the cutback in demand for their products was random, temporary, or of a longer duration. Since the tendency of most economic units probably is to extrapolate the experience of recent years into the near future, the firms' immediate response to the slowing in demand was to allow inventories to pile up in anticipation of a later run-off with the resumption of normal demand.

As demand continued to slow, firms were faced with the choice of reducing prices, output, or both.

Costs of production continued to rise rapidly. Unit labor costs, for example, rose at a 5.5 percent rate from late 1969 to late 1970, reflecting a 7.5 percent increase in compensation per man-hour and a 1.8 percent increase in output per man-hour. Thus, reducing prices and maintaining the same level of output could well result in substantially larger declines in profit rates. Output could, however, be slowed at first with less cost simply by eliminating overtime; that is, output could change without initially affecting employment.

As the slowing in demand persisted, it became necessary to take stronger steps to eliminate the rising inventory levels. Again firms were faced with the choice of changing prices or output. Since prices of most productive factors are established for long periods, it is often less costly to reduce employment than factor prices. For example, wage contracts are often negotiated for a three-year period, so that wages of the *working* employees are set; interest payments on capital equipment and other loans are set for years in advance; rent contracts are also negotiated for more than a short period. Thus it is easier to release workers — normally the least productive ones first — than it is to get them to take pay cuts. The minimum wage law is another obstacle to lowering wages, thereby encouraging the reduction of employment.

Firms will still be reluctant to release employees, at first, however, since there is a cost to hiring and retraining workers later, after demand picks up. Consequently, firms' decisions to release employees do not begin with the initial slowing in demand, but only after it becomes apparent that the slowing is more than temporary. Because of downward wage rigidities and a lack of knowledge on the part of the workers that the slowing in demand is pervasive,⁹ employment normally falls before prices are reduced. Workers demand higher wages, in anticipation of continually rising commodity prices and because they believe (incorrectly, in the case of many of the less productive workers) they can obtain employment elsewhere, if necessary.

Eventually wage and other contracts are re-negotiated, and at that time, the prices of productive factors can be brought into line with the lower level of demand. A reduction in factor costs makes it possible for firms to lower prices, as does the increase in productivity which should occur with the decision not

⁹See Roger W. Spencer, "High Employment Without Inflation: On the Attainment of Admirable Goals," this *Review* (September 1971). There are significant costs of acquiring information to both firms and workers.

to utilize the least efficient labor and capital resources. If firms *expect* their own costs (wages, rent, interest payments, raw resource costs) to continue rising, they will attempt to continue increasing the prices of their own products to cover costs. At the aggregate level, they can be successful in permanently boosting prices if output is reduced or aggregate demand is re-stimulated by monetary and fiscal actions.

The initial acceleration in the rate of price increase was begun by stimulative monetary and fiscal actions, and the initial slowing in aggregate demand followed restrictive policy actions. The rate of increase in prices peaked and began decelerating sometime later. Firms and workers' decisions, then, in establishing price, wage, and employment patterns are closely related to stabilization actions, although the lag patterns often differ.

Expectations are important in this view of economic behavior because: (1) firms do not know what to expect from the initial fall in demand; (2) after it is established that the fall in demand is more than temporary, workers do not know what to expect in the way of demand for their services when they are asked to leave (or invited to take a wage cut); (3) firms do not know throughout the process what to expect in terms of costs of releasing and eventually re-hiring employees and re-negotiating new factor price contracts, the eventual strength of demand after the fall, and the costs of carrying excessive inventories over the entire period. However, if firms expect their own costs to continue to rise, they may attempt to increase prices despite widespread current unemployment.

This scenario of events in the late 1960s can only suggest the complexity of the element of expectations and the difficulty of capturing such an element in an economic model. The St. Louis model attempts to aggregate price expectations of all workers and firms by relating current prices to a weighted average of past prices. This relation indicates that under "normal

conditions," the prices of one to two years ago have the strongest impact on current price anticipations.

The imposition of price-wage controls is, among other things, an attempt to alter the normal pattern of price anticipations. The initial success of last fall's "freeze" in altering price anticipations through curbs on actual prices may have been lost by the sharp rise in prices during the first quarter of 1972.

Summary

Two basic models of economic activity are described in this article. The standard model historically has emphasized the spending components of aggregate demand and employment while the St. Louis model stresses the relation between policy actions and total spending, and the division of total spending into real output and prices.

The standard model can explain the existence of sluggish demand and high unemployment the past two years, but has had limited success in projecting price increases. The St. Louis model, which utilizes price expectations directly in its determination of actual prices, has been more accurate in projecting continued inflation over the 1969-71 period.

Both models projected stronger economic activity in 1972 than in 1970 or 1971, and GNP data for the first quarter of 1972 suggest this will be the case.¹⁰ Prices, however, have risen at a rather rapid pace in recent months despite price-wage control measures. The St. Louis model indicates that unless expectations of higher prices can be curbed, inflation will not soon dissipate. If prices are allowed to subside gradually through moderate gains in total spending, price expectations will fall with or without the shock treatment of controls.

¹⁰See "The Economy in 1972," this *Review* (February 1972) for a comparison of the projections of the St. Louis model and other 1972 forecasts.



Measurement of the Domestic Money Stock*

by ALBERT E. BURGER and ANATOL BALBACH

Under certain circumstances, the current definition of money does not reflect international capital flows that change the money holdings of U.S. residents. This article analyzes those circumstances in which this can occur and presents a domestic money stock series that captures these influences. It may be that total spending responds not only to changes in the growth of money, but also to changes in the proportion held by U.S. residents. Therefore, it is hoped that the data provided will generate studies which compare the relationship between total spending and changes in the domestic money stock, as well as the relative efficiency with which domestic money can be controlled by the monetary authorities.

MASSIVE dollar outflows in 1969, 1970 and 1971 have focused renewed attention on the impact of international financial transactions on the money stock, and therefore on total spending in the United States. For example, in a review of financial developments in the third quarter of 1971, the Federal Reserve stated:

It seems likely that the sharp slowing of M_1 growth in August [1971] was in large part attributable to the heavy outflow of dollars into foreign exchange markets.¹

An airplane being loaded with U.S. dollars and flying off to foreign lands is a common interpretation of dollar outflows. This is an incorrect view since, given the current inconvertibility of the U.S. dollar into gold or other reserve assets and the use of the U.S. dollar as an international reserve currency, an outflow of dollars simply means that demand deposits of U.S. residents are declining and deposits of foreign residents at U.S. banks are increasing. It will be shown that in certain important cases these transactions have no effect on the money stock as it is currently defined.

It is reasonable to expect that foreign owners of deposits at U.S. banks are subject to different variables affecting their portfolio adjustments than are domestic depositors. This is particularly true when one considers that the dollar is used as an international reserve currency. Therefore, for purposes of predicting economic activity and controlling such activity, it becomes important to measure not only the changes in the money stock but also its composition.

This article first shows how international transactions affect both the current measure of the money

stock and an alternative measure, which we will call the domestic money stock. Secondly, a brief history and explanation of the derivation of the current measure of the money stock is presented. Third, series on foreign demand and time deposits are constructed and are then used to derive a domestic money stock series. These series are presented in the appendix.

Impact of International Transactions on Current Money Stock

The money stock (M_1), as currently defined, includes (in addition to domestic demand deposits): U.S. commercial bank demand deposits due to foreign individuals, partnerships, corporations, commercial banks, central banks, and international institutions; deposits of U.S. branches of foreign banks, U.S. agencies of foreign banks, and Edge Act subsidiaries of domestic banks; and foreign deposits at the Federal Reserve. The more broadly defined money stock (M_2) includes, in addition, domestic and foreign time deposits except for negotiable time certificates of deposit of \$100,000 or more.

In order to examine how foreign transactions affect the U.S. money stock (M_1 and M_2), as currently defined, this section discusses and presents the balance sheet effects of these transactions in simple T-account form. Exhibit I gives a general view of the various transactions and their effects on the money stock, as currently defined, and on a domestic money stock series. The examples represent transactions associated with an outflow of dollars from the United States. By reversing signs, the impact of inflows can be analyzed. It is assumed that there is no convertibility into gold and other reserve assets and that exchange stabilization agreements have produced a situation where dollars are used as a source of international liquidity and as an intervention currency.

Suppose that U.S. imports increase relative to exports or that U.S. residents increase their purchases

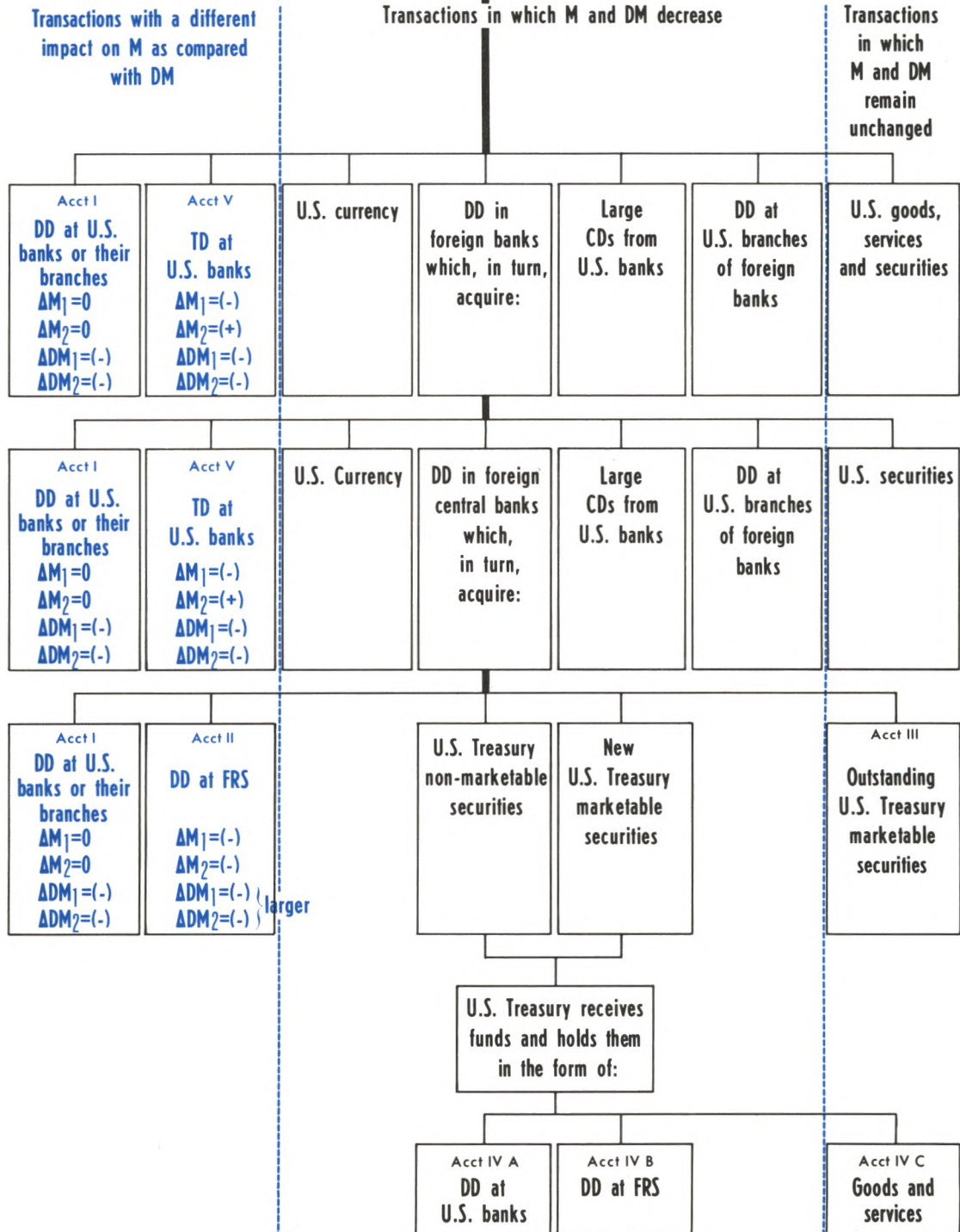
^oIn the early stages of preparation for this article, Mr. Clark Warburton made available to the authors his work on constructing a private domestic money stock series. Also, the authors benefited from comments by Professor Michele Fratianni. The authors assume sole responsibility for the analysis and conclusion of the article.

¹"Financial Developments in the Third Quarter of 1971," Federal Reserve *Bulletin* (November 1971), p. 872.

Exhibit I

Impact of Dollar Outflows on U.S. Monetary Accounts

FOREIGNERS ACQUIRE DOLLAR BALANCES IN THE FORM OF:



of foreign assets, securities, or foreign deposits. In either case, foreign sellers find themselves holding more U.S. dollars than before. To determine the effect on the U.S. money stock we must answer the question: *What do foreigners do with the increased dollar balances?*

Foreigners have several alternatives. They can: (1) increase purchases of U.S. goods and services and securities; (2) increase their deposits at U.S. banks, or at foreign branches of U.S. banks; (3) increase their deposits at banks in their own country; (4) increase their deposits at branches of foreign banks in the United States; and (5) increase their holdings of U.S. currency. In the following discussion we will consider only the first four alternatives.

In the first case, there is no net change in the U.S. money stock because dollar balances are reinjected directly back into the hands of U.S. residents. In the second case, demand deposits of U.S. residents decrease, but demand deposits of foreigners at U.S. banks (also part of the money stock) increase, as shown in Account I (also see Exhibit I).

Account I

Foreigners Increase Demand Deposits
at U.S. Banks

U.S. Banks	
(unchanged) Reserves	(-) Demand Deposits (U.S.)
	(+) Demand Deposits (Foreign)

In the case where foreigners deposit dollars in foreign banks, a further question must be asked: *What do the foreign commercial banks do with the dollar deposits?* The foreign banks may increase their dollar deposits at their correspondent banks in the United States, or they may sell these dollars to their central bank. In the first situation, demand deposits of U.S. residents at U.S. banks decrease and demand deposits of foreign banks at U.S. banks (which are included in the U.S. money stock) increase. There is no net change in the money stock. The final T-account results would be the same as illustrated in Account I. If foreigners or foreign banks increase their demand deposits at U.S. branches of foreign banks, money stock, as currently defined, will decrease.

If foreign banks sell dollars to their central bank, then the question arises: *What does the central bank do with the dollars?* The foreign central bank may: (1) increase its dollar deposits at U.S. commercial banks; (2) increase its dollar balances at the Federal Reserve; (3) increase its dollar balances at the Federal Reserve and instruct the Federal Reserve to buy

U.S. government securities for its account; or (4) buy special nonmarketable securities directly from the U.S. Treasury. Since deposits of foreign central banks at U.S. commercial banks are included in the money stock, then (1) would result in no net change in the money stock, and the final T-account effect would be the same as illustrated in Account I.

If foreign central banks hold increased deposits at the Federal Reserve, *the initial effect is no change in the money stock* (since deposits of foreigners at the Federal Reserve are part of the current definition of M_1 and M_2). The initial effect of this transaction is illustrated in Account II. *Such a transaction, however, decreases the reserve base of U.S. banks*, and as a result, the money stock decreases over time, if not offset by other actions.

Account II

Increase in Deposits of Foreign Central Banks
at the Federal Reserve

U.S. Banks	
(-) Reserves	(-) Demand Deposits (U.S.)
Federal Reserve	
	(+) Deposits of Foreign Central Banks
	(-) Reserves

If, instead of holding increased dollar balances at the Federal Reserve, the foreign central bank instructs the Federal Reserve Bank of New York to buy securities for the foreign central bank's account, then there is no net change in the money stock or the reserve base. Account III illustrates this result, where the items above the dotted line show the first stage of the transaction, comparable to Account II, and the items below the dotted line show the effect of the Federal Reserve purchase of securities for foreign account.

Account III

Increase in Deposits of Foreign Central Banks at the
Federal Reserve and the Federal Reserve Purchases
Securities for Foreign Account

U.S. Banks	
(-) Reserves	(-) Demand Deposits (U.S.)
(+) Reserves	(+) Demand Deposits (U.S.)
Federal Reserve	
	(+) Deposits of Foreign Central Banks
	(-) Reserves
	(-) Deposits of Foreign Central Banks
	(+) Reserves

Another alternative use of dollar balances that has become available to foreign central banks in recent

years is the purchase of nonmarketable securities directly from the U.S. Treasury. To analyze the effect of this action on the money stock one additional question must be answered: *What does the Treasury do with the proceeds from the sale of these securities?* The Treasury has three options: (1) increase Treasury deposits at commercial banks; (2) increase Treasury deposits at the Federal Reserve; or (3) spend the proceeds. If the Treasury uses either options (1) or (2) the money stock decreases (since Treasury deposits are not included in the current money stock). The result for the case where the Treasury increases its deposits at U.S. commercial banks is illustrated in Account IV-A, and the case where Treasury deposits at the Federal Reserve are increased is shown in Account IV-B. *When Treasury deposits at the Federal Reserve are increased, this also results in a decrease in the reserve base.* Hence, option (2) has a potentially greater contractionary influence on the money stock than option (1). If the Treasury spends the proceeds, the money stock is unchanged, as illustrated in Account IV-C. The same results occur when foreign official agencies buy *newly issued marketable* securities from the Treasury.

Account IV

FOREIGN CENTRAL BANK BUYS NONMARKETABLE OR NEWLY ISSUED MARKETABLE SECURITIES FROM THE TREASURY

A. Treasury Increases Its Deposits at Commercial Banks

U.S. Banks	
(unchanged) Reserves	(-) Demand Deposits (U.S.)
	(+) Demand Deposits (Treasury)
Treasury	
(+) Demand Deposits	(+) Securities

B. Treasury Increases Its Deposits at the Federal Reserve

U.S. Banks	
(-) Reserves	(-) Demand Deposits (U.S.)
Federal Reserve	
	(+) Demand Deposits (Treasury)
	(-) Reserves
Treasury	
(+) Deposits at Federal Reserve	(+) Securities

C. Treasury Spends the Proceeds

U.S. Banks	
(unchanged) Reserves	(-) Demand Deposits (U.S.)
	(+) Demand Deposits (U.S.)

Treasury	
(+) Demand Deposits	(+) Securities
(-) Demand Deposits	
(+) Goods and Services	

If foreign holdings of dollars increase there is one additional use of these dollars that has not yet been discussed. Foreigners may increase their holdings of time deposits in U.S. banks. For example, a decrease in demand deposits of U.S. residents may reappear as an increase in time deposits of foreign individuals or commercial banks. Since M_2 excludes large negotiable time certificates of deposits (CDs), the effect on M_2 depends upon whether foreigners increase their holdings of large CDs or their holdings of other time deposits.

First, assume as in the previous cases, there is an outflow of dollar deposits that appears on the balance sheets of U.S. banks as a decrease in demand deposits of U.S. residents. Now let us suppose foreigners increase their holdings of other time deposits (net time deposits rise). In this case, initially required reserves are decreased and in the ensuing adjustment process, M_1 decreases but M_2 rises (total demand plus net time deposits rise, but demand deposits alone decrease). This result is illustrated in Account V. However, if foreigners use these dollar claims to increase their holdings of large CDs newly issued by U.S. banks, the result of these transactions would be a decrease in M_1 and M_2 (because large CDs are not included in either measure).

Account V

Foreigners Increase Holdings of Other Time Deposits

U.S. Banks	
(unchanged) Reserves	(-) Demand Deposits (U.S.)
	(+) Net Time Deposits (Foreign)

As illustrated by the above examples, the current definition of the money stock (M_1) does not reflect dollar outflows when foreigners (either private or official) increase their demand deposits at U.S. commercial banks. These transactions must be viewed as neutral in terms of their impact on the U.S. economy through money stock, as currently defined. The current definition of M_1 does not reflect the full effect of an increase in foreign deposits at the Federal Reserve on money balances of U.S. residents. Also, an outflow of dollars from demand deposits that reappears as an increase in foreign holdings of other time deposits results in an increase in M_2 , as currently defined; this reflects both the increase in foreign time deposits and

the expansionary effect of the reduction in required reserves caused by the switch from demand to time deposits.

Impact of International Transactions on the Domestic Money Stock

A domestic money stock (DM_1) should reflect the effect of dollar outflows on money holdings of U.S. residents. Excluding foreign deposits that offset changes in holdings of money balances by U.S. residents from the money stock results in substantial differences in the effects of some foreign transactions on the money stock.² For example, in the case illustrated in Account I, where there was an outflow of dollars that appeared as a decrease in demand deposits of U.S. residents and an increase in foreign demand deposits of U.S. banks, the domestic money stock (DM_1 and DM_2) would decrease, whereas the money stock, as currently defined, would remain unchanged. If foreign deposits at the Federal Reserve rise, then the domestic money stock would decrease by more than the current money stock. DM_1 would decrease by the amount of the increase in foreign deposits at the Federal Reserve as well as by the effect of the decrease in the reserve base. When foreign time deposits rise DM_2 would decrease, in contrast to the current definition of M_2 which would increase. Exhibit I presents alternative forms of dollar holdings by foreigners and the effects of a dollar outflow on the current definition of money as compared to its proposed alternative.

Except in those cases where foreigners reinject money into the U.S. economy either through direct purchases of securities or indirectly through Treasury spending, dollar outflows are associated with decreases in the domestic money stock.

Federal Reserve Measurement of the Money Stock

Since the domestic money stock data are derived from the current Federal Reserve Board estimates of the money stock, it is necessary to present a description of how various components are currently derived and entered into the final concept of the money stock series.³

²In the construction of the domestic money stock series, we were unable to estimate foreign holdings of U.S. currency because of limitations of the data. Therefore, domestic money stock excludes foreign deposits only.

³The Federal Reserve System did not publish comprehensive estimates of the components of the money stock until the early 1940s. In 1941, the Federal Reserve published *Banking*

On June 8, 1959, the Federal Reserve System appointed the *Ad Hoc* Committee on Money Supply Statistics.⁴ This committee issued a report on October 8, 1959, entitled *Recommendations for Statistics of Money Supply and Member Bank Reserves* that formed the basis for the present money stock series published by the Federal Reserve System.⁵

The definition of money chosen by the Federal Reserve was based on a "means-of-payment" or "medium-of-exchange" concept.⁶ This concept of money did not deny the possible importance of other "liquid assets." However, the System argued that:

Even the most liquid of these other types of assets, however, must generally be converted into money, as defined here, before being used in economic transactions. The amount of nonmonetary financial instruments outstanding is not limited by the supply of reserve funds as is the volume of bank deposits. It is true that reserves are needed to support time deposits in member banks but the amount absorbed in this way is relatively small and is allowed for in the reserve projections before assessing the reserve actions needed for monetary purposes.⁷

The Federal Reserve System decided that, for the purposes of monetary policy, "the most useful definition of the money supply covers the total of the

Studies in which estimates appeared for bank deposits and currency, 1890-1940. In 1943, *Banking and Monetary Statistics* was published, and included were series on currency outside banks and demand deposits adjusted. Until October 1960, there was no item in the Federal Reserve statistics labeled "money stock," although the components of the money stock appeared in the table "Consolidated Condition Statement for Banks and the Monetary System."

⁴The *Ad Hoc* Committee was appointed by the Chairman of the Research Advisory Committee at the request of the Federal Open Market Committee, Roland Robinson, who at that time was an Adviser for the Division of Research and Statistics at the Board of Governors, was chosen as Chairman of the *Ad Hoc* Committee. Other members of the committee included William J. Abbott, Harry Brandt, Robert S. Einzig and Clarence W. Tow.

⁵In Federal Reserve publications and elsewhere, the term money supply instead of money stock often appears. The data are collected as an average of amounts at points in time, hence a stock concept. Therefore, except in direct quotations, the term money stock rather than money supply will be used.

⁶There are several major theoretical or "a priori" approaches to the concept of money. One of these is the "medium-of-exchange" or "means-of-payment" concept of money. The other is the "liquidity" concept of money. An important distinction between these two approaches is the emphasis each places on supply and demand conditions for "money." The liquidity concept stresses demand conditions. Money is only one of many assets that economic units may choose to hold in their wealth portfolios. One factor influencing wealth-holders' portfolio decisions is the relative liquidity of various assets. The means-of-payment concept emphasizes the supply conditions for the asset called money. See Milton Friedman and Anna J. Schwartz, *Monetary Statistics in the United States: Estimates, Sources, Methods* (New York: Columbia University Press, 1970), Chapter 3, especially pp. 136-137.

⁷"A New Measure of the Money Supply," *Federal Reserve Bulletin* (October 1960), p. 1103.

public's holdings of coin, currency, and demand deposits in banks."⁸ Included in the nonbank public were individuals, business firms, nonbank financial institutions (such as savings and loan companies), mutual savings banks and life insurance companies, state and local governments, foreign official and private institutions, and after mid-1962, foreign demand balances at Federal Reserve Banks.⁹

The Federal Reserve System first began publication of a separate and distinct money stock series in the October 1960 Federal Reserve *Bulletin*. In the write-up accompanying this section, it was stated:

The amount of money in existence and changes in this amount influence the course of economic developments. For this reason accurate measurement of the money supply and of changes in the supply is of great importance. . . .

The Federal Reserve System has primary responsibility for regulating the total volume of money available to meet the public's demands.¹⁰

Due to the institutional structure of commercial banking and the availability of reported data, several measurement problems remained. The major one of these, that relates to the construction of the domestic money stock series, was an adjustment for cash items in process of collection.

The number assigned to the money stock at any point in time should represent the amount of money that money holders *assume* they have available to use, not necessarily the amount that bank records show they hold.¹¹ The difference between bank records and holder records arises because of bank float, which develops when banks give depositors credits for checks deposited with them before the banks on which the checks were written have debited the accounts of persons who wrote the checks. The method used by the Federal Reserve to correct for this double counting is to subtract cash items in process of collection (CIPC) from gross demand deposits.¹²

⁸*Ibid.*

⁹Demand deposits that banks in U.S. territories and possessions held at U.S. commercial banks were also added to the money stock data.

¹⁰"A New Measure," p. 1102.

¹¹To be in exact conformity with the money stock concept chosen by the Federal Reserve, the measurement of money should be based on records of money holders. Ideally, by checking the actual records of each economic unit, one could determine at any point in time the amount of currency, coin and demand deposits that the nonbank public assumes it holds. Because of the great practical difficulties involved in such a measurement procedure, an indirect method was chosen. Rather than directly examining the records of each money holder, an approximation was used based on bank records.

¹²Another source of double counting, called Federal Reserve float, arises due to delays in clearing and collecting checks

Inclusion of Foreign Deposits in the Money Stock

Prior to 1960, demand deposits adjusted, which were reported in the table "Consolidated Condition Statement for Banks and the Monetary System" in the Federal Reserve *Bulletin*, included demand deposits due to foreign individuals, partnerships, corporations, governments and government agencies, but excluded demand deposits due to foreign banks and foreign deposits at the Federal Reserve Banks.¹³

In the development of the money stock series in 1960, demand balances of foreign banks at U.S. commercial banks were included in the money stock. This decision was made jointly with the decision to include demand balances of mutual savings banks at commercial banks. These foreign deposits, which were initially excluded from the money stock by the subtraction of "Interbank Deposits," were added back into the money stock figures in the item "Interbank Demand Deposits of Foreign and Mutual Savings Banks" (see Table I).¹⁴

The following justification was given for including foreign bank deposits:

Amounts due to these institutions represent cash available for investment in much the same way as balances of other financial institutions and involve no duplication of funds held by others.¹⁵

Foreign demand deposits held at Federal Reserve Banks were added to the money stock in August 1962, and included demand balances at Federal Reserve Banks due to foreign governments, central banks and international institutions. The addition of these foreign deposits to the money stock was justified on the same basis as the inclusion of deposits due to foreign banks.

through the Federal Reserve System. The misstatement of the money stock arising from this source is not removed by deducting cash items from gross demand deposits. To avoid this bias in the money stock, Federal Reserve float is also deducted from demand deposits to arrive at the demand deposit component of the money stock.

¹³Demand deposits adjusted were computed by deducting demand balances due to banks, which included foreign banks.

¹⁴Estimates of demand balances due to foreign banks were prepared separately for member and nonmember banks. In 1960, it was estimated that for the period 1947 to date foreign demand balances were in the range of \$1.3-\$1.8 billion. Beginning April 26, 1961, weekly reporting member banks were required to report separate figures for demand balances due to foreign banks. This change permitted more accurate estimation of demand balances due to foreign banks, which had previously been available only from call reports for, at most, four dates a year.

¹⁵"A New Measure," p. 1103.

[They] may be used for investments or other expenditures in much the same way as foreign demand balances with commercial banks. . . . With their addition the daily average series includes all demand deposit and currency liabilities to foreigners.¹⁶

At that time the Federal Reserve was confident that adding foreign deposits at Federal Reserve Banks had almost no effect on the past money stock data.

Over the 1950-57 period foreign balances at Federal Reserve Banks showed a fairly steady decline. However, estimates indicate that roughly offsetting increases occurred in foreign balances at commercial banks. Consequently, the estimated total of foreign demand balances was relatively stable and has not shared in the growth of the total money supply since 1947. The addition of foreign balances at Federal Reserve Banks to the demand deposit component has had no observable effect on seasonal factors for this series.¹⁷

In 1969 and 1970, certain types of international transactions produced additions to the deposits used to compute the money stock. The August 1969 revision of the money stock data resulted primarily from Eurodollar transactions by commercial banks. These transactions did not involve any double counting of demand deposits held by the public; yet they operated to reduce the demand deposit component of the money stock because the cash items generated by these transactions were deducted from it. Effective July 31, 1969, under a revision of Federal Reserve Regulation D, the issuing banks were required to include bills payable checks and London checks used in repayment and borrowing of Eurodollars in gross demand deposits as well as in cash items in process of collection.

The major part of the November 1970 money stock revision was precipitated by international transactions involving Edge Act corporations and U.S. agencies and branches of foreign banks. These transactions did not give rise to deposit liabilities at domestic commercial banks to offset the cash items generated.¹⁸ To correct for this measurement error in the demand deposit component of the money stock, data were collected from U.S. agencies and branches of foreign banks and from Edge Act corporations, and added to gross member bank demand deposits.

¹⁶"Revision of Money Supply Series," Federal Reserve *Bulletin* (August 1962), p. 944.

¹⁷*Ibid.*

¹⁸A deposit of an Edge Act corporation or similar institution was treated as an interbank deposit by a U.S. bank, and, therefore, was not included in the demand deposit component of money. The cash items generated by these transactions were included in total cash items which are deducted from gross demand deposits (see Table I).

The August 1969 and November 1970 revisions did not generally result in a net addition of a new class of foreign deposits, as had the 1960 and 1962 revisions. In the 1969 and 1970 revisions, certain classes of foreign deposits were added to the data to compute the money stock only to offset the cash items in process of collection that these transactions generated. However, foreign agencies and Edge Act corporations are now treated as part of the commercial banking system for purposes of money stock measurement, and as a result, a small amount of deposits held more or less permanently by their customers were added to the money stock data.¹⁹

The Construction of the Current Money Stock Series

The procedure for measuring the money stock is summarized in Table I.²⁰ First, the currency component of the money stock is estimated by using Treasury data, Federal Reserve data on member bank vault cash and estimates of nonmember bank vault cash. Second, gross member bank demand deposits are computed, based on weekly reports of member banks. Gross demand deposits are then adjusted by deducting deposits that are not due to the nonbank public, such as deposits due to the U.S. Government and banks. Third, nonmember bank demand deposits adjusted are estimated using semi-annual benchmark data from call reports and country member bank data.²¹ Data from the records of Federal Reserve Banks is used for foreign deposits at Federal Reserve Banks and Federal Reserve float. Subtracting Federal Reserve float from demand deposits adjusted and adding these foreign deposits yields the demand deposit component of the money stock. M_2 is constructed by adding to the money stock (M_1) commercial bank savings deposits, time deposits, and time certificates

¹⁹"Revision of the Money Stock," Federal Reserve *Bulletin* (December 1970), p. 892.

²⁰One of the recommendations of the *Ad Hoc* Committee was that figures for the money stock be based on daily average data. Beginning in the October 1960 Federal Reserve *Bulletin*, the Federal Reserve began publishing a semi-monthly money stock series based on averages of daily figures extending back to January 1947. The series were presented on an unadjusted and seasonally adjusted basis. Also, a non-seasonally adjusted weekly series was published for 1960. To the extent that money stock data were used in making policy decisions, the daily average series replaced the last-Wednesday and call report data published regularly in the *Bulletin*. In June 1964, the System began publication of monthly average money stock data based on weighted averages of semi-monthly data. In July 1965, the System began publishing weekly and monthly seasonally adjusted data computed on a daily average basis and extending back to January 1959.

²¹About one-fourth of the demand deposit portion of the money stock is accounted for by nonmember banks.

Table I

Method of Computing Money Stock (M_1 and M_2)

A. Currency Component	
	Currency in Circulation ¹
Less:	Vault Cash of Commercial Banks ^{2,4}
B. Demand Deposit Component of Member Banks	
	Gross Demand Deposits ²
Less:	Interbank Demand Deposits ²
	U.S. Government Demand Deposits ²
	Cash Items in Process of Collection ²
Plus:	Interbank Demand Deposits of Foreign Banks, International Institutions and Mutual Savings Banks ³
C. Demand Deposit Component of Nonmember Banks	
	Gross Demand Deposits ⁴
Less:	Interbank Demand Deposits ⁴
	U.S. Government Demand Deposits ⁴
	Cash Items in Process of Collection ⁴
D. Demand Deposit Component of Money Stock	
	(B) plus (C)
Less:	Federal Reserve Float ⁵
Plus:	Foreign Deposits with Federal Reserve Banks ⁵
E. Money Stock M_1	
	(A) plus (D)
F. Money Stock M_2	
	Money Stock M_1
Plus:	Savings Deposits, Time Deposits Open Account and Time Certificates of Deposit Excluding Domestic Interbank and U.S. Government Time Deposits ^{2,4}
Less:	Negotiable Time Certificates of Deposit Issued in Denominations of \$100,000 or More ⁶

¹Currency in circulation, which includes all Treasury and Federal Reserve issues outside the Treasury and Federal Reserve Banks, is derived from daily U.S. Treasury statements and appears in the Federal Reserve *Bulletin* table "Member Bank Reserves, Federal Reserve Bank Credit, and Related Items."

²Total gross demand deposits of member banks, member bank vault cash, savings and other time deposits, interbank demand deposits, U.S. Government demand deposits and cash items in process of collection are derived from the "Report of Deposits, Vault Cash and Federal Funds Transactions" of member banks to their respective Federal Reserve Banks. These reports are made on a daily average basis for the week.

³Member bank interbank deposits of foreign and mutual savings banks are derived from the "Consolidated Report of Condition of Member Banks" to their respective Federal Reserve Banks. This report is made at mid-and end-of-year dates. Weekly data are estimated by using ratios of these deposits at member banks to such deposits at large commercial banks on the semi-yearly call dates and multiplying them by the weekly figures of large commercial banks, reported weekly in the "Weekly Condition Report of Large Commercial Banks."

⁴Total gross nonmember bank demand deposits, nonmember bank vault cash, savings and other time deposits, interbank demand deposits of domestic commercial banks, U.S. Government demand deposits and cash items in process of collection are estimated from semi-yearly "Consolidated Report of Condition of All Banks" to the Federal Deposit Insurance Corporation. The nonmember bank demand deposits adjusted weekly data are estimated by taking the ratio of these semi-yearly figures to similar figures of country member banks of the same date and multiplying them by corresponding numbers reported weekly in country member banks' "Report of Deposits, Vault Cash and Federal Funds Transactions."

⁵Federal Reserve float and Foreign and International demand deposits at Federal Reserve Banks are derived from daily Federal Reserve records.

⁶Negotiable time certificates of deposit issued in denominations of \$100,000 or more are derived from the "Weekly Condition Report of Large Commercial Banks."

of deposit, exclusive of negotiable time certificates of deposit issued in denominations of \$100,000 or more by large weekly reporting commercial banks.

The Measurement of Domestic Money Stock

The Construction of Foreign Demand and Time Deposit Series

Demand deposit liabilities of U.S. commercial banks to foreign individuals, partnerships and corporations (IPC deposits) are not reported separately in the weekly "Report of Deposits, Vault Cash and Federal Funds Transactions," but are lumped together with domestic IPC deposits. Therefore, to estimate these foreign deposits, data collected by the Treasury Department were used. These data appear in the Federal Reserve *Bulletin* table entitled "Short-Term Liabilities to Foreigners Reported by Banks in the United States, by Type," column headed "Demand Deposits to Other Foreigners."²²

Table II

Construction of Foreign Demand and Time Deposit Series

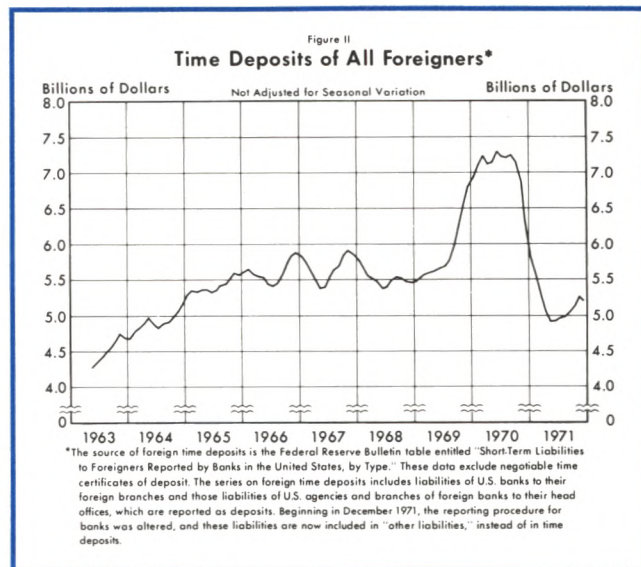
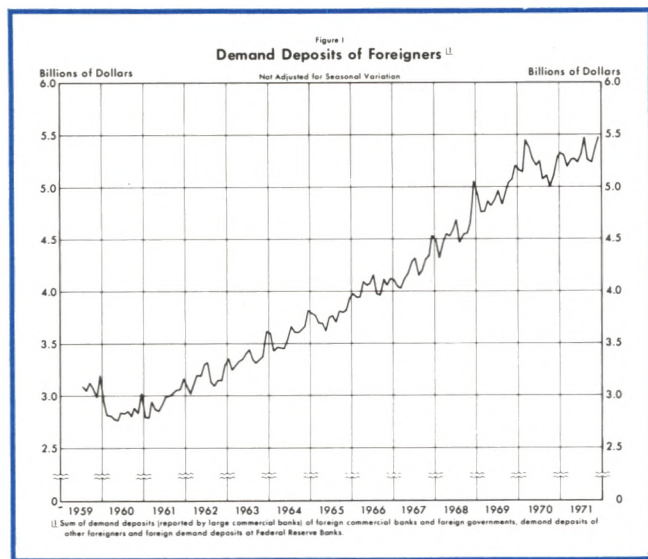
Foreign Demand Deposits	
	U.S. Commercial Banks' Demand Deposit Liabilities to Foreign Individuals, Partnerships and Corporations
Plus:	U.S. Commercial Banks' Demand Deposit Liabilities to Foreign Governments and Commercial Banks
Plus:	Foreign Deposits at Federal Reserve Banks
Foreign Deposits	
	Foreign Demand Deposits
Plus:	Net Time Deposits of All Foreigners

The demand deposit liabilities of U.S. commercial banks to foreign governments and commercial banks were taken from the Federal Reserve *Bulletin* table entitled "Assets and Liabilities of Large Commercial Banks," from the columns "Demand Deposits of Foreign Govts., etc." and "Commercial Banks."²³ This source was preferable to the data in "Short-Term Liabilities to Foreigners Reported by Banks in the United States, by Type" because the former excludes U.S. commercial bank liabilities to their foreign branches.

Foreign deposits at Federal Reserve Banks were taken from the Federal Reserve *Bulletin* table entitled

²²These data were computed by averaging end-of-month data for the current and preceding month to make them roughly comparable with daily average data.

²³These data were computed by averaging weekly data. For weeks that overlap months, only days that fall in the current month were used.



“Member Bank Reserves, Federal Reserve Bank Credit, and Related Items,” the column entitled “Deposits, Other Than Member Bank Reserves, With F.R. Banks, Foreign.” A small amount of foreign deposits of international institutions at the Federal Reserve reported separately were added to this total.²⁴

The source of foreign time deposits is the Federal Reserve *Bulletin* table entitled “Short-Term Liabilities to Foreigners Reported by Banks in the United States, by Type,” column entitled “To All Foreigners.” These data exclude negotiable time certificates of deposit.²⁵ The series on foreign time deposits includes liabilities of U.S. banks to their foreign branches and those liabilities of U.S. agencies and branches of foreign banks to their head offices, which are reported as deposits. Hence, the level of foreign time deposits is biased upward by this amount. Beginning in December 1971, the reporting procedure for banks was altered, and these liabilities are now included in “Other Short-Term Liabilities,” instead of in time deposits.

Foreign demand deposits at U.S. branches of foreign banks, U.S. agencies of foreign banks and Edge Act corporations are not included in the foreign deposit series. The current measure of demand deposits, which is one of the components used in construction of domestic money stock, reflects changes in domestic demand deposits resulting from transactions involving these foreign deposits.²⁶

²⁴These data are available on a daily average basis.

²⁵These data were computed by averaging end-of-month data for the current and preceding month.

²⁶An outflow of dollars decreases demand deposits of U.S. residents and increases demand deposits of foreigners at

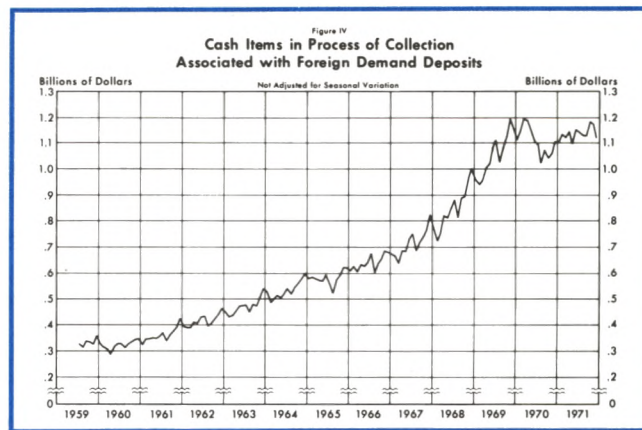
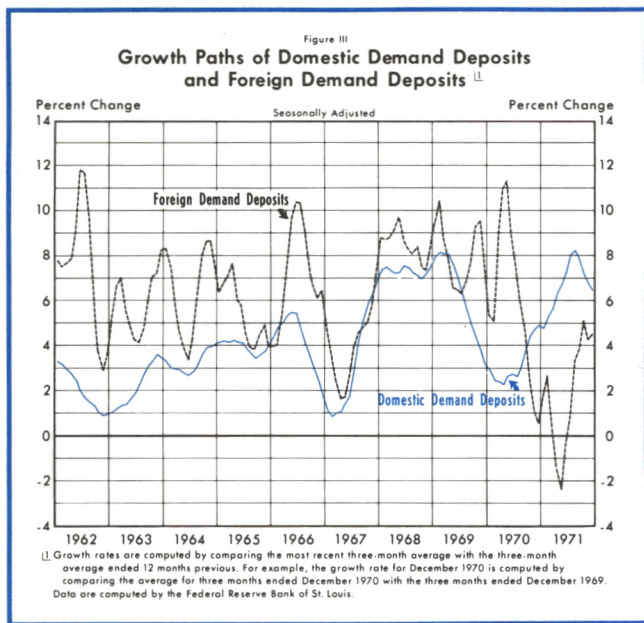
The construction of the monthly series on foreign demand deposits and foreign time deposits is illustrated in Table II and the data are presented in the Appendix. Figures I and II show the movements of the two series, and Figure III compares the growth of domestic demand deposits and foreign demand deposits.²⁷

Construction of Domestic Money Stock Series

Transactions involving foreign deposit accounts generate cash items in process of collection in much the same way as do domestic deposit transactions. Therefore, if foreign deposits are removed from the money stock data, some estimate of the cash items arising from transactions in these accounts must be added back into the money stock data (CIPC, including foreign CIPC, are deducted from gross demand deposits). Unless this adjustment is made, changes in CIPC arising from foreign deposit transactions will

institutions mentioned above. However, cash items in process of collection associated with these transactions are deducted from gross demand deposits and therefore cause a decrease in the money stock. As long as these foreign demand deposits do not become permanent, thus producing an elimination of CIPC and reserve clearing among U.S. banks, these dollar outflows are accounted for in the current measure of the money stock. Since most of these deposits are of a temporary nature, and since data on deposits held permanently by foreigners at U.S. branches and agencies are not available, we assume that the level of these deposits is fairly constant and thus are not included in our series on foreign deposits.

²⁷Growth rates are computed by comparing the most recent 3-month average with the 3-month average ended 12 months previously. For example, the growth rate for December 1970 is computed by comparing the average for the 3 months ended December 1970 with the 3 months ended December 1969.



result in biased estimates of the domestic money stock.

Unfortunately, only total CIPC data are reported; no separation is made between CIPC arising from foreign deposit transactions. Consequently, foreign CIPC were estimated as a ratio of total CIPC by the following procedure:²⁸

$$CIPCF = \left(\frac{DDF}{DD} \right) \left(\frac{CIPC}{LCB} \right)$$

The monthly estimates of cash items in process of collection generated by foreign deposits included in the money stock data are illustrated in Figure IV and given in the Appendix.

Not seasonally adjusted deposit data and cash items in process of collection were used in constructing the DM₁ and DM₂ series. To develop the seasonally adjusted money stock series, domestic demand deposits and domestic time deposits were seasonally adjusted

²⁸Demand deposits and cash items in process of collection by large commercial banks are converted to a daily average basis by averaging weekly data. For weeks that overlap months, only days that fall in the current month were included.

CIPCF = Cash items in process of collection arising from transactions in demand deposits due to foreigners

DDF = Demand deposits due to foreigners at commercial banks; demand deposits due to foreigners at Federal Reserve Banks are excluded

DD_{LCB} = Total demand deposits reported by large commercial banks

CIPC_{LCB} = Total cash items in process of collection reported by large commercial banks

separately using the X-11 seasonal adjustment computer program.²⁹ The seasonally adjusted currency component of the money stock was then added to seasonally adjusted domestic demand deposits to compute seasonally adjusted domestic money stock. The seasonally adjusted DM₂ series was constructed by adding seasonally adjusted net domestic time deposits to seasonally adjusted domestic M₁. The construction of the domestic money stock series is illustrated in Table III, and monthly data for these series are presented in the Appendix to this article.

Table III	
Construction of Domestic Money Stock Series	
Domestic Money Stock (DM₁)	
	Demand Deposit Component of Money Stock (NSA)
Less:	Foreign Demand Deposits (NSA)
Plus:	Cash Items in Process of Collection Associated with Foreign Demand Deposits (NSA)
Equals:	Domestic Demand Deposits (NSA)
Plus:	Seasonal Adjustment by X-11 Program
Equals:	Domestic Demand Deposits (SA)
Plus:	Currency Component of Money Stock (SA)
Equals:	Seasonally Adjusted Domestic Money (DM ₁)
Domestic Money Stock (DM₂)	
	Net Time Deposits (NSA)
Less:	Net Foreign Time Deposits (NSA)
Plus:	Seasonal Adjustment by X-11 Program
Equals:	Seasonally Adjusted Net Domestic Time Deposits
Plus:	Seasonally Adjusted DM ₁
Equals:	Seasonally Adjusted Domestic Money (DM ₂)

²⁹This procedure closely approximates the Federal Reserve Board's method of seasonally adjusting the demand deposit component of money. However, in addition to the X-11 program, the Board sometimes uses "informed judgment" to compute seasonal factors.

Conclusions

Outflows of dollars do not result in a change in the money stock series as currently defined when foreigners increase their demand deposits at U.S. commercial banks. Although the *composition* of ownership of demand deposits is changed — U.S. residents hold less and foreigners hold more U.S. demand deposit balances — the money stock remains unchanged. Similarly, in the case where central banks increase their holdings of demand deposits at the Federal Reserve, the current money stock does not reflect the initial effect of this action on domestic demand deposits.

In both domestic money stock series developed in this article, outflows of dollars result in changes in the money stock series in all cases except where the dollars are reinjected directly back into deposits held by U.S. residents. A change in the composition of the ownership of demand deposits affects the growth of domestic money. For example, a decrease in demand

deposits of U.S. residents and an increase in demand deposits owned by foreigners at U.S. commercial banks would appear as a decrease in the domestic money stock series.

Concern with the growth of money is twofold: (1) changes in the supply and demand for this asset result in predictable portfolio adjustments by economic units, and hence predictable effects on spending, which generates income for U.S. residents and influences prices and employment, and (2) the Federal Reserve can control the growth trend of money. When foreign deposits were included in the U.S. money stock data, the Federal Reserve asserted that these deposits were available for spending, the same as other deposits. However, it may be that foreigners react differently to changes in their holdings of dollars than do U.S. residents. In such a case, it is not only the size of the money stock that is important for stabilization policy, but also the composition of the money stock.

This article and the accompanying Appendix are available as Reprint No. 77

APPENDIX

In this section the basic data used in constructing the domestic money stock series are presented. The following projected seasonal factors for 1972 are presented for those readers interested in updating the seasonally adjusted domestic demand deposit series. These factors are to be applied to the not seasonally adjusted domestic demand deposit series. This series may be updated by using the data available in the Federal Reserve *Bulletin* in the tables cited in the text of this article.

January	103.5	July	99.3
February	99.0	August	98.3
March	98.9	September	99.2
April	100.8	October	99.8
May	98.0	November	100.6
June	99.2	December	103.0

Basic Data for Construction of Domestic
Money Stock Series¹
(Billions of Dollars)

Date	Unadjusted Domestic Demand Deposits				Seasonally Adjusted Domestic Money Stock (DM ₁)			Seasonally Adjusted Domestic Money Stock (DM ₂) ⁵			
	Demand Deposits ² (NSA)	Foreign Demand Deposits (NSA)	Foreign CIPC ³ (NSA)	= Domestic Demand Deposits (NSA)	Demand Deposits (SA)	+ Currency ⁴ (SA)	= DM ₁ (SA)	Net Foreign Time Deposits ⁶ (NSA)	Net Domestic Time Deposits (SA)	+ DM ₁ (SA)	= DM ₂ (SA)
7/59	114.000	3.095	0.328	111.233	113.015	29.000	142.015				
8/59	113.600	3.047	0.312	110.865	112.769	29.100	141.869				
9/59	114.200	3.129	0.336	111.407	112.281	29.000	141.281				
10/59	114.500	3.062	0.333	111.771	111.784	29.000	140.784				
11/59	115.400	2.987	0.327	112.740	111.652	28.900	140.552				
12/59	116.800	3.193	0.355	113.962	110.700	28.900	139.600				
1/60	116.800	2.964	0.329	114.165	110.649	29.000	139.649				
2/60	113.300	2.816	0.315	110.799	110.353	29.000	139.353				
3/60	111.700	2.812	0.306	109.194	110.005	29.000	139.005				
4/60	112.600	2.773	0.286	110.113	109.566	29.000	138.566				
5/60	110.300	2.764	0.315	107.851	109.700	29.000	138.700				
6/60	110.400	2.840	0.327	107.887	109.745	29.000	138.745				
7/60	110.600	2.831	0.328	108.097	109.760	29.000	138.760				
8/60	111.200	2.852	0.312	108.660	110.516	29.000	139.516				
9/60	112.100	2.802	0.325	109.623	110.481	29.000	139.481				
10/60	112.900	2.881	0.335	110.354	110.315	29.000	139.315				
11/60	113.600	2.830	0.344	111.114	110.021	29.000	139.021				
12/60	115.900	3.022	0.346	113.224	109.960	28.900	138.860				
1/61	116.400	2.794	0.326	113.932	110.367	29.000	139.367				
2/61	113.800	2.791	0.344	111.353	110.918	28.900	139.818				
3/61	113.000	2.947	0.345	110.398	111.227	28.900	140.127				
4/61	114.600	2.871	0.351	112.080	111.509	29.000	140.509				
5/61	112.900	2.857	0.348	110.391	112.329	28.900	141.229				
6/61	113.200	2.911	0.355	110.644	112.544	28.900	141.444				
7/61	113.200	2.989	0.369	110.580	112.261	29.000	141.261				
8/61	113.200	2.993	0.339	110.546	112.511	29.100	141.611				
9/61	114.600	3.021	0.360	111.939	112.853	29.200	142.053				
10/61	115.800	3.052	0.374	113.122	113.029	29.300	142.329				
11/61	117.300	3.061	0.390	114.629	113.504	29.400	142.904				
12/61	120.000	3.164	0.423	117.259	113.845	29.600	143.445				
1/62	120.200	3.087	0.392	117.505	113.708	29.600	143.308				
2/62	117.100	3.014	0.390	114.476	114.067	29.700	143.767				
3/62	116.100	3.113	0.389	113.376	114.206	29.800	144.006				
4/62	117.800	3.190	0.410	115.020	114.314	30.000	144.314				
5/62	115.200	3.182	0.406	112.424	114.406	30.000	144.406				
6/62	115.200	3.295	0.430	112.335	114.149	30.100	144.249				
7/62	115.200	3.315	0.433	112.318	114.085	30.100	144.185				
8/62	114.500	3.137	0.397	111.760	113.947	30.200	144.147				
9/62	115.400	3.092	0.404	112.712	113.728	30.300	144.028				
10/62	116.900	3.146	0.424	114.178	114.054	30.300	144.354				
11/62	118.200	3.141	0.439	115.498	114.402	30.400	144.802				
12/62	121.100	3.286	0.461	118.275	114.780	30.600	145.380				
1/63	122.000	3.352	0.448	119.096	115.106	30.700	145.806				
2/63	118.600	3.248	0.432	115.784	115.524	30.900	146.424				
3/63	117.600	3.283	0.435	114.752	115.659	31.000	146.659				
4/63	119.600	3.330	0.454	116.724	115.969	31.100	147.069				
5/63	117.200	3.350	0.473	114.323	116.530	31.300	147.830	4.286	92.791	147.830	240.621
6/63	117.600	3.408	0.475	114.667	116.507	31.500	148.007	4.340	93.542	148.007	241.549
7/63	118.400	3.445	0.477	115.432	117.126	31.600	148.726	4.406	94.218	148.726	242.944
8/63	118.000	3.347	0.449	115.102	117.438	31.800	149.238	4.490	95.028	149.238	244.266
9/63	119.300	3.315	0.479	116.464	117.483	31.900	149.383	4.555	95.609	149.383	244.992

Date	Unadjusted Domestic Demand Deposits				Seasonally Adjusted Domestic Money Stock (DM ₁)			Seasonally Adjusted Domestic Money Stock (DM ₂) ⁵			
	Demand Deposits ² (NSA)	Foreign Demand Deposits (NSA)	Foreign CIPC ³ (NSA)	Domestic Demand Deposits (NSA)	Domestic Demand Deposits (SA)	Currency (SA)	DM ₁ (SA)	Net Foreign Time Deposits ⁶ (NSA)	Net Domestic Time Deposits (SA)	DM ₁ (SA)	DM ₂ (SA)
10/63	121.000	3.346	0.474	118.128	117.884	32.000	149.884	4.651	96.336	149.884	246.220
11/63	122.800	3.377	0.506	119.929	118.810	32.300	151.110	4.755	97.187	151.110	248.297
12/63	124.800	3.618	0.539	121.721	118.044	32.500	150.544	4.699	98.015	150.544	248.559
1/64	125.900	3.597	0.523	122.826	118.559	32.600	151.159	4.688	98.258	151.159	249.417
2/64	122.000	3.429	0.485	119.056	119.007	32.800	151.807	4.786	98.964	151.807	250.771
3/64	120.900	3.465	0.498	117.933	118.932	32.900	151.832	4.829	99.391	151.832	251.223
4/64	122.900	3.455	0.513	119.958	119.103	33.100	152.203	4.898	100.087	152.203	252.290
5/64	120.000	3.451	0.503	117.052	119.487	33.300	152.787	4.977	100.912	152.787	253.699
6/64	120.800	3.533	0.519	117.786	119.570	33.500	153.070	4.891	102.033	153.070	255.103
7/64	122.300	3.666	0.540	119.174	120.820	33.600	154.420	4.842	102.731	154.420	257.151
8/64	122.100	3.610	0.519	119.009	121.492	33.800	155.292	4.893	103.582	155.292	258.874
9/64	124.200	3.605	0.542	121.137	122.163	33.900	156.063	4.918	104.710	156.063	260.773
10/64	126.000	3.630	0.560	122.930	122.601	34.000	156.601	4.991	105.666	156.601	262.267
11/64	127.300	3.662	0.576	124.214	123.101	34.200	157.301	5.069	106.749	157.301	264.050
12/64	130.300	3.818	0.600	127.082	123.184	34.200	157.384	5.167	108.041	157.384	265.425
1/65	131.300	3.788	0.581	128.093	123.528	34.400	157.928	5.295	109.617	157.928	267.545
2/65	126.500	3.770	0.586	123.316	123.534	34.600	158.134	5.345	111.428	158.134	269.562
3/65	125.900	3.697	0.580	122.783	123.903	34.700	158.603	5.338	112.327	158.603	270.930
4/65	128.400	3.695	0.574	125.279	124.353	34.700	159.053	5.350	113.478	159.053	272.531
5/65	124.200	3.619	0.571	121.152	123.835	34.900	158.735	5.350	114.342	158.735	273.077
6/65	125.900	3.748	0.595	122.747	124.430	35.000	159.430	5.327	115.465	159.430	274.895
7/65	126.700	3.768	0.560	123.492	125.065	35.200	160.265	5.353	116.900	160.265	277.165
8/65	126.000	3.704	0.522	122.818	125.365	35.500	160.865	5.428	118.221	160.865	279.086
9/65	128.600	3.809	0.573	125.364	126.355	35.700	162.055	5.446	119.650	162.055	281.705
10/65	130.800	3.797	0.592	127.595	127.244	36.000	163.244	5.510	121.323	163.244	284.567
11/65	131.900	3.821	0.623	128.702	127.607	36.100	163.707	5.585	122.962	163.707	286.669
12/65	136.000	3.924	0.623	132.699	128.597	36.300	164.897	5.562	124.443	164.897	289.340
1/66	137.600	3.978	0.609	134.231	129.400	36.600	166.000	5.614	125.658	166.000	291.658
2/66	132.500	3.944	0.627	129.183	129.712	36.700	166.412	5.649	126.513	166.412	292.925
3/66	132.400	3.944	0.605	129.061	130.323	36.900	167.223	5.577	127.047	167.223	294.270
4/66	135.800	4.088	0.634	132.346	131.328	37.100	168.428	5.557	128.649	168.428	297.077
5/66	131.000	4.051	0.628	127.577	130.510	37.300	167.810	5.538	130.410	167.810	298.220
6/66	132.700	4.078	0.641	129.263	130.840	37.400	168.240	5.449	130.997	168.240	299.237
7/66	131.500	4.154	0.676	128.022	129.466	37.600	167.066	5.428	132.375	167.066	299.441
8/66	130.500	3.974	0.603	127.129	129.695	37.800	167.495	5.456	133.433	167.495	300.928
9/66	133.100	3.963	0.637	129.774	130.739	37.900	168.639	5.559	134.371	168.639	303.010
10/66	133.600	4.116	0.657	130.141	129.830	38.000	167.830	5.734	135.124	167.830	302.954
11/66	134.100	4.051	0.685	130.734	129.690	38.200	167.890	5.848	135.597	167.890	303.487
12/66	137.800	4.117	0.680	134.363	130.225	38.300	168.525	5.879	136.489	168.525	305.014
1/67	137.900	4.102	0.674	134.472	129.652	38.500	168.152	5.837	138.192	168.152	306.344
2/67	133.400	4.043	0.666	130.023	130.826	38.700	169.526	5.753	140.042	169.526	309.568
3/67	134.600	4.030	0.639	131.209	132.559	38.900	171.459	5.615	141.433	171.459	312.892
4/67	136.300	4.116	0.686	132.870	131.829	39.000	170.829	5.477	143.944	170.829	314.773
5/67	133.500	4.165	0.685	130.020	133.004	39.100	172.104	5.384	146.069	172.104	318.173
6/67	136.500	4.276	0.729	132.953	134.359	39.300	173.659	5.398	148.247	173.659	321.906
7/67	137.600	4.315	0.751	134.036	135.370	39.400	174.770	5.541	150.003	174.770	324.773
8/67	137.700	4.148	0.688	134.240	136.843	39.500	176.343	5.642	151.595	176.343	327.938
9/67	140.000	4.191	0.719	136.528	137.496	39.700	177.196	5.705	153.125	177.196	330.321
10/67	142.000	4.295	0.740	138.445	138.230	39.900	178.130	5.852	154.566	178.130	332.696
11/67	143.400	4.334	0.763	139.829	138.791	40.000	178.791	5.929	155.785	178.791	334.576
12/67	147.400	4.536	0.824	143.688	139.300	40.400	179.700	5.863	156.795	179.700	336.495
1/68	148.800	4.492	0.767	145.075	139.963	40.600	180.563	5.776	158.063	180.563	338.626
2/68	143.000	4.313	0.725	139.412	140.514	40.700	181.214	5.692	159.708	181.214	340.922
3/68	143.400	4.459	0.752	139.693	141.167	41.100	182.267	5.569	160.835	182.267	343.102

Date	Unadjusted Domestic Demand Deposits				Seasonally Adjusted Domestic Money Stock (DM ₁)			Seasonally Adjusted Domestic Money Stock (DM ₂) ⁵			
	Demand Deposits ² (NSA)	Foreign Demand Deposits (NSA)	Foreign CIPC ³ (NSA)	Domestic Demand Deposits (NSA)	Domestic Demand Deposits (SA)	Currency ⁴ (SA)	DM ₁ (SA)	Net Foreign Time Deposits ⁶ (NSA)	Net Domestic Time Deposits (SA)	DM ₁ (SA)	DM ₂ (SA)
4/68	146.600	4.548	0.819	142.871	141.726	41.300	183.026	5.514	161.880	183.026	344.906
5/68	143.700	4.526	0.811	139.985	143.100	41.600	184.700	5.485	162.752	184.700	347.452
6/68	146.600	4.595	0.844	142.849	144.181	41.900	186.081	5.394	163.880	186.081	349.961
7/68	147.800	4.686	0.882	143.996	145.249	42.000	187.249	5.414	165.003	187.249	352.252
8/68	147.300	4.462	0.812	143.650	146.316	42.300	188.616	5.495	167.077	188.616	355.693
9/68	149.600	4.546	0.887	145.941	147.007	42.700	189.707	5.536	169.134	189.707	358.841
10/68	151.500	4.555	0.893	147.838	147.819	42.800	190.619	5.523	171.287	190.619	361.906
11/68	154.100	4.650	0.966	150.416	149.423	43.200	192.623	5.478	173.429	192.623	366.052
12/68	159.100	5.058	1.002	155.044	150.440	43.400	193.840	5.472	175.394	193.840	369.234
1/69	160.700	4.930	0.958	156.728	151.234	43.600	194.834	5.487	176.583	194.834	371.417
2/69	154.400	4.760	0.940	150.580	151.873	43.900	195.773	5.529	177.180	195.773	372.953
3/69	154.600	4.764	0.954	150.790	152.342	44.100	196.442	5.583	177.629	196.442	374.071
4/69	158.200	4.866	1.004	154.338	153.079	44.200	197.279	5.604	178.122	197.279	375.401
5/69	153.500	4.820	1.017	149.697	152.854	44.500	197.354	5.616	178.371	197.354	375.725
6/69	155.800	4.877	1.080	152.003	153.275	44.700	197.975	5.664	179.528	197.975	377.503
7/69	156.400	4.963	1.111	152.548	153.731	44.900	198.631	5.693	178.298	198.631	376.929
8/69	154.300	4.830	1.026	150.496	153.132	45.200	198.332	5.767	177.193	198.332	375.525
9/69	156.100	4.949	1.081	152.232	153.285	45.300	198.585	5.972	177.145	198.585	375.730
10/69	157.600	5.038	1.119	153.681	153.760	45.600	199.360	6.233	176.742	199.360	376.102
11/69	158.900	5.073	1.196	155.023	153.928	45.900	199.828	6.525	176.702	199.828	376.530
12/69	162.900	5.207	1.153	158.846	154.024	46.000	200.024	6.785	176.323	200.024	376.347
1/70	165.400	5.159	1.110	161.351	155.927	46.200	202.127	6.937	176.181	202.127	378.308
2/70	156.800	5.141	1.142	152.801	154.335	46.400	200.735	7.111	175.631	200.735	376.366
3/70	158.400	5.450	1.196	154.146	155.806	46.700	202.506	7.242	176.394	202.506	378.900
4/70	162.600	5.379	1.191	158.412	157.164	47.100	204.264	7.135	178.140	204.264	382.404
5/70	158.000	5.267	1.156	153.889	157.051	47.600	204.651	7.159	179.491	204.651	384.142
6/70	160.100	5.203	1.107	156.004	157.255	47.700	204.955	7.283	181.492	204.955	386.447
7/70	160.700	5.251	1.097	156.546	157.650	48.000	205.650	7.233	184.027	205.650	389.677
8/70	160.400	5.070	1.021	156.351	159.034	48.100	207.134	7.218	186.997	207.134	394.131
9/70	163.200	5.110	1.073	159.163	160.295	48.300	208.595	7.249	189.509	208.595	398.104
10/70	164.600	5.004	1.041	160.637	160.859	48.500	209.359	7.154	191.983	209.359	401.342
11/70	166.300	5.100	1.063	162.263	161.151	48.700	209.851	6.882	193.980	209.851	403.831
12/70	171.300	5.291	1.103	167.112	162.060	49.000	211.060	6.324	196.992	211.060	408.052
1/71	172.300	5.328	1.103	168.075	162.455	49.300	211.755	5.808	202.266	211.755	414.021
2/71	166.500	5.304	1.133	162.329	163.997	49.700	213.697	5.574	207.161	213.697	420.858
3/71	168.000	5.190	1.120	163.930	165.680	50.000	215.680	5.317	211.971	215.680	427.651
4/71	172.300	5.257	1.145	168.188	166.837	50.500	217.337	5.056	214.806	217.337	432.143
5/71	169.400	5.271	1.099	165.228	168.556	50.800	219.356	4.927	217.025	219.356	436.381
6/71	172.700	5.241	1.153	168.612	169.931	51.100	221.031	4.935	219.948	221.031	440.979
7/71	174.100	5.312	1.138	169.926	171.093	51.600	222.693	4.963	220.742	222.693	443.435
8/71	173.000	5.472	1.127	168.655	171.589	51.700	223.289	4.992	221.865	223.289	445.154
9/71	174.300	5.254	1.126	170.172	171.438	51.900	223.338	5.050	223.474	223.338	446.812
10/71	175.300	5.235	1.183	171.248	171.594	52.200	223.794	5.136	225.924	223.794	449.718
11/71	176.900	5.373	1.172	172.699	171.616	52.200	223.816	5.265	228.252	223.816	452.068
12/71	181.500	5.473	1.118	177.145	171.819	52.500	224.319	5.202	231.151	224.319	455.470

¹Data are based on revisions through the February 1972 Federal Reserve *Bulletin*.

²Demand deposit series published in the Federal Reserve *Bulletin* table entitled "Components of Money Stock Measures and Related Items."

³Cash items in process of collection associated with foreign demand deposits.

⁴Currency series published in the Federal Reserve *Bulletin* table entitled "Components of Money Stock Measures and Related Items."

⁵Prior to 1963 foreign demand and time deposits are not reported separately in the data source used to construct the time deposit series.

⁶The source of foreign time deposits is the Federal Reserve *Bulletin* table entitled "Short-Term Liabilities to Foreigners Reported by Banks in the United States, by Type." These data exclude negotiable time certificates of deposit. The series on foreign time deposits includes liabilities of U.S. banks to their foreign branches and those liabilities of U.S. agencies and branches of foreign banks to their head offices, which are reported as deposits. Beginning December 1971, the reporting procedure for banks was altered, and these liabilities are now included in "Other Liabilities," instead of in time deposits.

Problems of the International Monetary System and Proposals for Reform—1944-70

by CHRISTOPHER L. BACH

RECENT international economic events and government pronouncements have focused renewed attention on the future of the Bretton Woods international monetary system. What is the system now? What would we like it to be in the future? The debate is not a new one. Economists for years have recognized the system's actual and potential problems and have proposed a plethora of solutions to resolve questions about: (1) the distribution, size, and growth of international reserves; (2) the difficulty of international adjustment in a world of highly mobile capital when nations are committed to full employment; (3) the confidence problem, that is, shifts in preferences among national currencies and other kinds of reserve assets; and (4) the appropriate role for gold. Financial ministers and heads of central banks have also debated these questions.

Quite often, analyses of current problems and future needs of the international monetary system have arisen only out of monetary crises, and the adopted *ad hoc* solutions have shown no comprehensive plan for the future of the Bretton Woods system. Now, for perhaps the first time since 1944, there is general agreement that all aspects of the Bretton Woods system should be re-evaluated, and that certain characteristics of the system be altered to meet the requirements of international trade and exchange in the 1970s.

The critical economic problems which brought questions about restructuring the Bretton Woods system to the forefront of economic discussion at the conclusion of the 1960s were short-term capital flows and the failure of the system to promote international adjustment. These problems were natural developments from gradually changing economic conditions

in the 1950s and 1960s. Lower international trade barriers, the establishment of general currency convertibility in 1958, improved capital markets, and the growth of multinational corporations contributed to increased capital mobility. Lack of harmonization of stabilization policies among nations, inappropriate alignment of parity rates, and political constraints on changing parity rates contributed to problems of international adjustment. Recent actions among major industrial countries have made a start toward restructuring the Bretton Woods system with new parity rates, widened margins, and the use of SDRs.

The following article summarizes the historical development from 1944-70 of the problems that arose in twenty-five years of operation of the system, and discusses some of the proposals offered toward the conclusion of the 1960s to remedy the major shortcomings of the system. The purpose of looking at the historical development of the problems and the proposed solutions is to provide a backdrop for current discussions of international monetary arrangements. While the events of 1971 and 1972 already indicate a movement toward correcting some of the problems, they have also revealed new problems, the discussion of which is beyond the scope of this article.

THE BRETTON WOODS SYSTEM AND THE INTERNATIONAL MONETARY FUND

Let us begin by examining the design of the International Monetary Fund (IMF). The Articles of Agreement state the purposes of the institution as follows:

- (i) To promote international monetary cooperation through a permanent institution which provides the machinery for consultation and collaboration on international monetary problems.
- (ii) To facilitate the expansion and balanced growth of international trade, and to contribute thereby to the promotion and maintenance of high levels of employment and real income and to the development of the productive resources of all members as primary objectives of economic policy.
- (iii) To promote exchange stability, to maintain orderly exchange arrangements among members, and to avoid competitive exchange depreciation.
- (iv) To assist in the establishment of a multilateral system of payments in respect of current transactions between members and in the elimination of foreign exchange restrictions which hamper the growth of world trade.
- (v) To give confidence to members by making the Fund's resources temporarily available to them under adequate safeguards, thus providing them with opportunity to correct maladjustments in their balance of payments without resorting to measures destructive of national or international prosperity.
- (vi) In accordance with the above, to shorten the duration and lessen the degree of disequilibrium in the international balances of payments of members.¹

Parity Values

The mechanism chosen to promote international cooperation while facilitating high levels of employment and real income was a regime of defined parity rates. From time to time, parity rates were to be redefined whenever necessary to correct fundamental disequilibria in balances of payments. In order to maintain consistency in the definition of parity rates, each nation effectively defined its currency in terms of gold. Thus, all currencies were tied to gold and indirectly to each other.

Within a group of nations whose currencies were fully convertible and in which the currency of one nation served as both domestic and international money, the number of exchange rates that could be *independently* defined was one less than the total number of nations. For example, in a group of three nations, country A can state the monetary value of its currency in terms of C's currency, and country B can state the monetary value of its currency in terms

of C's currency. By virtue of this action the parity rate between country A and B is defined. If all three countries attempted to independently define their parity rates, a conflict would develop if one country sought to increase a parity that another country was trying to lower. Thus, at least one country had to observe a passive policy in defining its parity rate. By practice, that country in the Bretton Woods system has been the United States (country C in the above example).

Once a system of parity rates was defined, countries had to choose how to meet their exchange rate stability obligations. Individual member countries were originally required to limit exchange rate fluctuation to one percent on either side of parity. Most countries chose to limit exchange rate fluctuations by using the dollar as the intervention currency for spot transactions in the foreign exchange market.

The United States chose to meet its exchange stability obligations through purchases and sales of gold at \$35 an ounce. It is important to note that the price of monetary gold is not a parity rate in the same sense as an exchange rate of one national currency for another. However, under the rules of the IMF, a change in the U.S. price of gold can alter parity rate relationships just as does a change in a parity rate, assuming the dollar rate for any currency is not devalued to the same extent as the dollar.

Liquidity

Gold, convertible currencies, and general balances at the IMF were the major sources of international liquidity in the Bretton Woods system. The IMF had at its disposal two means for assuring international liquidity. A temporary means of increasing the supply of liquidity available to an individual nation was a procedure known as "drawing" on the general account of the Fund. Individual nations could borrow from the Fund's pool of currencies (which had been contributed on the basis of a pre-arranged quota system) in order to finance temporary balance-of-payments deficits. From time to time quotas could be increased to raise the amount of potential liquidity available to members.

After 1968, the Fund acquired the ability to consciously supplement the long-run growth of reserve assets permanently available to all member nations by creating Special Drawing Rights (SDRs). Participating countries were free to draw on the special account of the Fund without consultation or challenge of policies designed to restore balance-of-payments equilibrium (unlike drawing on the general account).

¹International Monetary Fund, *Articles of Agreement* (Washington, D.C.: International Monetary Fund, 1944 and 1969), p. 2.

Countries which used SDRs might incur an obligation to "reconstitute" their position with the IMF to some extent, depending on the amount and duration of SDR use.

Balance-of-Payments Correction

Because countries were expected to experience balance-of-payments disequilibria from time to time, a method had to be devised to eliminate surpluses and deficits which would involve neither trade or payments restrictions nor undermine the essence of a par value system. Provision of ample liquidity (reserves) merely provided time for countries to take corrective balance-of-payments action, but did not in itself eliminate surpluses and deficits. Furthermore, it was only persistently large deficits and surpluses which the Fund viewed as detrimental to international monetary order.

Stabilization policies were expected to be the first line of defense in eliminating reserve gains and losses. It was presumed that countries would use monetary and fiscal policies to achieve high-employment objectives, and no country was expected to suffer severe unemployment to protect its balance-of-payments position. It was also felt that domestic stabilization policies could remedy many external payments problems with little loss of domestic real output.

If stabilization policies were insufficient to restore a country's competitive position with its major trading partners, the member country could propose to the Fund a change in its parity rate. The Fund was required to concur with the request when it was satisfied that the change was necessary to correct a fundamental disequilibrium in the balance of payments.

HISTORICAL EVOLUTION OF THE BRETTON WOODS SYSTEM AND ITS PROBLEMS

The Bretton Woods system never worked quite the way it was intended. As background for understanding the current problems of the system, let us briefly review the problems that arose in twenty-five years of operation. Many current problems of international finance can be traced, directly or indirectly, to three major changes in economic institutions and practices since 1944. The first major change was the expanded use of the dollar as an international currency and a widely accepted reserve asset; the second was the great increase in the degree of economic interdependence among nations, especially as reflected in movements of highly mobile capital; and the third

was the comparative rigidity of parity rates that developed in actual practice.

The Dollar as an International Currency

The use of the dollar as an international reserve currency alleviated one problem of the Bretton Woods system but created two others. The problem that was remedied was the failure of gold, a key source of reserves in the Bretton Woods system, to provide a steady and sufficient increase in international liquidity over time. The newly created problems were (1) the gradual accumulation of dollars by foreigners, which were at first welcomed but later resented, and (2) the dilemma faced by a reserve currency center in seeking either to approximate external payments balance, or to provide an adequate growth of international reserves.

Gold Reserve Problems

The Bretton Woods system depended importantly on the efficient use and distribution of international reserves, especially at the conclusion of World War II and in the late 1940s. Because the United States held about 70 percent of the world's total gold stock and also had a substantial balance-of-payments surplus in this period, distribution of gold for use as international reserves proved difficult. Gold reserves available from other countries were insufficient to settle or "finance" their payments deficits with the United States. Even when gold reserves were supplemented with meager borrowings from the IMF and unilateral transfers from the United States, large payments imbalances would have occurred in the postwar period if there had not been tight regulation abroad of imports and capital movements.

Another problem related to gold was that the supply of the existing gold stocks and newly mined gold was insufficient to satisfy the increase over time of both monetary and nonmonetary demands at a fixed and unvarying price. Throughout the 1950s and 1960s gold demand for nonmonetary purposes rose as world income rose, as well as demands for other metals substitutable for gold in some uses (silver, platinum, and palladium). Gold demand for monetary purposes also rose along with the expansion of income and trade. However, because the rate of growth of the gold supply was both erratic and inadequate to match the expansion in demand over time, and since the price of gold was not permitted to rise, monetary authorities were increasingly hard pressed to obtain monetary gold for addition to international and domestic reserves.

Dollar Reserve Problems

The gold reserve problems would have been far more severe if they had not been alleviated by the expanded use of the U.S. dollar as a reserve asset and world currency after World War II.

The economic size and dominance of the United States made its currency desirable as an international reserve currency, both before and after 1939. Much of the world's trade involved U. S. goods, services, or financial resources, and in addition, the value of the American currency proved far more stable over time than that of many other national currencies (at least until the late-1960s). Wider acceptability resulted from wider use and vice versa.

With the creation of the IMF and the obligation of countries to maintain exchange rate stability, most countries chose to keep their exchange rate within prescribed margins by buying and selling dollars against the local currency. By virtue of this arrangement, dollars became an intervention currency, and countries held additional working balances in dollars – a use for dollars that had not existed before World War II.

The use of the dollar as an international currency relieved the shortage of gold reserves and provided sufficient liquidity to finance payments imbalances at existing exchange rates. However, the continued accumulation of dollars by major nations throughout the 1950s and 1960s raised questions about how many dollars foreigners would willingly hold, especially official foreigners. The United States was looked upon to provide long-term financial aid and grants to the lesser developed countries in the 1950s, and, as an international financial center, to supply capital resources for the expansion of European business firms and multinational corporations throughout the 1950s and 1960s. When U.S. deficits persisted, problems of interpretation arose as to whether the dollar outflow represented a fundamental weakness in the U.S. economy and therefore required corrective action, or whether the rules for international reserve accumulation and depletion that applied to trading nations were inappropriate for the United States which was the banker for the world as well.

U.S. Balance-of-Payments Policy

Throughout much of the 1960s many people pointed out that the reserve currency country faced a dilemma. It could either seek to approximate external payments balance, or permit its deficits to continue in order to provide adequate growth of inter-

national reserves. Those who argued that approximate payments balance was the more appropriate objective of the two reasoned that a reserve currency country which ran persistent deficits could continuously finance its deficit simply by printing bank money which official foreigners were obliged to hold, and thereby avoid adjustment of domestic incomes, costs, prices, and exchange rates. Consequently, the United States improved its economic position by acquiring foreign goods and assets while foreigners were left as unwilling holders of dollar assets. Some foreigners claimed that this behavior served only to finance American enterprise and military adventures abroad.

Those who argued that provision of ample international reserves was the more appropriate objective of the two admitted that the preceding argument was not altogether unfounded, but pointed out that it was an incomplete description of the position in which the reserve currency center was placed. Major determinants of U.S. deficits were not just domestic economic conditions over which it had some control, but also exchange rate alignment and inflexibility, the role of the dollar as an international currency, and persistent surpluses by major industrial nations in the late 1960s, over which it had little direct control. Given the general shortage of international liquidity and the failure of the international monetary system to promote adjustment, continued U.S. deficits were not altogether undesirable. The only danger lay in the fact that a crisis might be precipitated if there was a sudden decline in the desire of foreigners to hold dollars.

Given this dilemma in the 1960s, U.S. balance-of-payments policy had to take account of the

. . . haphazard linkage between the supply of additional reserves, provided by U.S. payments deficits, and the demand for them, combined with the great disruption that would result from applying the IMF prescription for fundamental disequilibrium to the United States. In dealing with its payments deficit, the United States has had to thread its way delicately between a desire to reduce the deficit and a desire to avoid measures for reducing the deficit that would be destructive of domestic objectives or international order.²

Many U.S. policy actions were directed toward reducing the deficit in the 1960s, although the efforts were not as active nor as effective as some would have liked.

²Richard N. Cooper, "The Dollar and the World Economy," in *Agenda for the Nation*, ed. Kermit Gordon (Washington, D.C.: The Brookings Institution, 1968), pp. 485-6.

Greater Economic Interdependence

More significant in the long run than the problems associated with gold, the expanded use of the dollar as an international currency, or U.S. balance-of-payments policies were the problems associated with greater economic interdependence. Greater economic interdependence and integration brought increasingly intense clashes between domestic and international considerations in framing economic policies.

Evidence of increased economic integration was seen in the financial and technical innovations of the payments system. Convertibility of major currencies into dollars after 1958 and the growth of the multinational corporation with its improved methods of cash management both diminished risks and uncertainties in foreign commerce and increased the flow and efficient use of real and financial resources. The rapid growth of the Eurodollar market since the late 1950s and the Eurobond market since the mid-1960s meant that investors and borrowers could place and acquire funds in either national or international markets depending on relative yields, costs, and risks.

The most obvious, but probably not the most serious, threat to the success of the Bretton Woods system in a world of growing capital mobility and economic interdependence was its susceptibility to destabilizing speculation and other large-scale flows of short-term capital. In a monetary system of general convertibility among currencies and integrated money and capital markets, incorrectly aligned exchange rates became difficult to maintain. Hedgers and arbitragers were quick to take advantage of interest rate differentials, and leads and lags of corporate payments and receipts contributed to large capital flows. In order to try to preserve parity values, central banks sometimes paid high prices in the loss of foreign exchange reserves, and on occasion had to subjugate national priorities to international concerns. When a government failed to convince speculators that a parity value could be maintained, it had to accept the outcome associated with a change in the parity rate — namely, a change in a country's growth of income, output, and prices.

Rigidity of Parity Rates and International Adjustment

A greater threat to the future of the Bretton Woods system than increased economic interdependence and speculation was its failure to initiate and promote international economic adjustment promptly and to distribute equitably the costs of adjustment among trading partners. Excessive reluctance to change par-

ity values eliminated an effective means of achieving international adjustment.

As price, output, and growth trends diverged, a country initially had to accept an increased or decreased outflow of foreign currency reserves at a given parity rate, and ultimately a change in internal prices, output, and income. Given the desire of most countries to achieve full employment of domestic resources, however, many were unwilling to permit the changes in internal economic conditions which the system required to remedy payments imbalances if parity rates remained unchanged. Because of the unwillingness of countries to alter their parity rates or permit changes in internal prices, outputs, and incomes, market pressures for adjustment were resisted and adjustment delayed as countries tried to shift at least part of the adjustment burden to other nations.

A corollary point was that in a moderately well integrated set of trading nations, a country which pursued domestic stabilization policies that resulted in a price and output performance *greatly* different from its trading partners experienced a higher rate of inflow or outflow of international reserves at a given parity rate than it did if domestic price and output performance was similar. The impact on reserves varied somewhat depending upon the size and relative efficiency of the nation. However, like the situation in the preceding paragraph, countries resisted the required changes in either parity rates or domestic economic conditions, and the Bretton Woods system failed to achieve adequate international adjustment.

Occasionally, stabilization policies were capable of achieving domestic and balance-of-payments objectives simultaneously and thereby permitted international adjustment. Nonetheless, in cases where conflicts arose in the 1960s, nations tended to choose to protect domestic employment and output. Tariffs, quotas, border taxes, and capital controls were often used (although at a reduced level from the 1950s) to insulate national markets from international repercussions. Such practices were disguised means of changing the parity rate and a second best solution to the adjustment problem.

The adjustment problem became particularly critical in the case of the United States. As its competitive position changed gradually over the years, the United States found itself unable to exert independent pressure on the exchange rates of dollars for other national currencies without disrupting international monetary arrangements (particularly in the 1960s). The diffi-

culty of bringing general policy instruments to bear on payments and adjustment problems was even more severe than in the case of the European economies because of the smallness of the U.S. foreign sector relative to its domestic sector, and because the United States, like the Europeans, often incurred policy conflicts between full employment and balance-of-payments objectives.

ALTERNATIVE SOLUTIONS

Numerous solutions were proposed to remedy the problems of the Bretton Woods system. Let us now review the major alternative solutions to the liquidity problem, the adjustment problem, and the U.S. balance-of-payments problem, principally those that were suggested in the late 1960s.

A Solution to the Liquidity Problem

The major solution proposed to resolve the liquidity problems of the Bretton Woods system was the rationalization of reserve creation by relying mainly on Special Drawing Rights—the supply of which was subject to conscious international control—rather than on gold or on U.S. dollars. This proposal was adopted in 1968 and implemented in 1970.³

Since their creation as an official reserve asset, SDRs have performed some of the functions of an international money. They have shared the role of a store of value with gold, and to a limited extent served as a medium of exchange among official institutions. However, it has been the dollar which has continued to perform *de facto*, if not *de jure*, each of the three classical functions of money for both private and official uses. As numeraire (common denominator or standard of value), medium of exchange, and store of value, the dollar has continued to serve as the dominant source of international money and liquidity.

It has been suggested that if all currencies were to be defined in terms of SDRs rather than gold or the dollar as at present, and all participating countries were to actively use SDRs in the purchase and sale of convertible currencies, some pressures on the dollar might be lessened. SDRs would then replace gold and dollars as the primary form of *official* reserve asset. Official reserve creation could be consciously controlled by international decisions, thereby removing the erratic and insufficient growth over time of official

reserves in the Bretton Woods system. The dollar, because of its convenience and efficiency of use in foreign exchange markets, would probably remain the principal *private* monetary asset.

Alternative Solutions to the Adjustment Problem

Solutions suggested over the last two decades for the adjustment problem centered around the choice of parities and how to change the parities when required, and how much exchange fluctuation to permit around parities.

Parity Rate Alignment

It was clear that if the adjustment process of the Bretton Woods system was to be improved, a way had to be found to promote orderly and periodic realignments of parity rates among major nations. Only when parity rates accurately reflected fundamental competitive positions and could be altered in the absence of anticipatory capital flows could a significant improvement in the adjustment process be expected.

By the late 1960s, no proposed solution had yet been agreed upon that could effectively deal with the problem. From the restoration of European convertibility in 1958 to the devaluation of the U.K. pound in late 1967, sluggishness of changing par values persisted and the balance-of-payments adjustment process proved more uncertain than the founding fathers of the system had anticipated. The series of shocks from mid-1967 to 1970 indicated that long-run stability of par values was being achieved at the expense of short-run stability in the world financial markets. Throughout the entire period, the United States as the key currency center could not effectively change dollar exchange rates for other currencies without fear of competitive rate changes or of disrupting international monetary arrangements. Theoretical suggestions were made in an attempt to define responsibilities of trading partners in initiating changes in parity rates, and in distributing the adjustment burden equitably among industrial nations, but none of the suggestions was practical enough to put into operation.

While little progress was made on the long-run adjustment problem, there was substantial sympathy toward the end of the 1960s for proposed solutions to short-run adjustment problems. Two alternatives were offered to increase the extent and speed of

³For a thorough discussion of the mechanics and operation of SDRs, see Fritz Machlup, *Remaking the International Monetary System: The Rio Agreement and Beyond* (Baltimore: John Hopkins University Press, 1968).

international adjustment in the Bretton Woods system once a system of "correct" parities had been determined — (1) a widening in the permissible margin of fluctuation around stable parities, and (2) frequent, small, discretionary or automatic changes in stable parities. Either of these alternatives, it was argued, would improve the short-run adjustment mechanism and initiate the balance-of-payments adjustment process more rapidly than in the past. However, it was also regarded as probable that neither alternative would substantially improve even the short-run adjustment process in the absence of an appropriately determined initial set of parity rates.

Stable Parity with Widened Margins

There was little doubt that widened margins about stable parities *could* increase the speed with which short-run adjustment was initiated and the extent to which demands for and supplies of currencies were either encouraged or discouraged. But there was also recognition that the expected improvement which would be promoted depended critically upon what people at any instant in time expected the *future* parity rate to be. If people widely believed that the future parity rate would be the same as the present parity, then wider margins would permit changes in foreign exchange prices to alter capital and trade flows to some extent without encouraging the massive one-sided speculation that sometimes occurred under a system of very narrow margins. Greater exchange rate flexibility would thereby partially insulate domestic money markets from international movements of short-term capital. Widened margins about stable parities might prove particularly desirable for countries in different cyclical positions. This type of short-run adjustment was not, however, to be regarded as a substitute for the long-run adjustment created by parity changes.

If, in contrast to the preceding example, there was widespread belief that the future parity rate would be substantially different from the present parity, speculative activities associated with the former uncertainties about parity rate changes would recur. In this situation there would be little that widened margins could do to discourage destabilizing and other large-scale flows of short-term capital.

The nature of these conclusions for an individual country would be complicated further if all nations had widened margins around their parities. Nations are unlikely to attach equal weight to the various objectives of economic policies. Some nations prefer to tolerate more unemployment, and others

more inflation, than their trading partners. In addition, governments differ in their ability to control domestic costs and prices. Thus, varying domestic economic conditions and policy actions might cause currencies to move to the floor or ceiling of the widened margin and stay there, causing sufficient concern to throw established parities into question. Even if the internal cost and price trends of all nations were identical, changes in the composition of internationally traded goods might necessitate changes in parity values. In these cases, widened margins might or might not be beneficial in promoting short-run international adjustment, depending upon the future exchange-rate expectations that would be generated.

Crawling Parity with Widened Margins

A crawling, or gliding, parity was offered as an alternative to the stable parity. It was often combined with suggestions for widened margins around parity. Under this system, the ability of widened margins to improve adjustment was subject to the same qualifications as in the preceding paragraphs.

The distinguishing feature about a crawling parity was that the parity value changed gradually over time up to an agreed upon maximum rate. Hence, in the short run the parity was essentially stable and could give a degree of certainty to international transactions, while in the long run the gradual change in parity could reflect small changes in relative costs and prices and initiate changes in balance-of-payments positions before disequilibria became massive. In a world of interdependent nations, frequent and small changes in parity values could compensate for differing effectiveness of internal stabilization policies and gradually changing international trade patterns.

Automatic vs. discretionary parity changes—The desirability of changing parities frequently and by small amounts (as illustrated by the crawling parity) depended in the minds of many observers on whether the small changes were discretionary and made by national governments, or whether they were automatic and made in the international market place. If the changes were discretionary, government officials still had to decide when and by how much to alter the parity rate, just as under the system of stable parities and very narrow bands. While frequent and small changes might reduce disruptive capital flows, government officials would still be pressured on occasion to make decisions that might have unpopular domestic economic effects. They would remain free to avoid international adjustment pressures if they

were willing and able to sustain a loss or gain of reserves, and they could still be swayed by domestic concerns to postpone changing the parity rate until financial and political pressures made it imperative.

If the parity and the margins about the parity rate were free to change up to an agreed upon maximum rate per year in either direction, the market place would determine fluctuations within the margins while government officials would limit the range of parity and exchange rate fluctuation by establishing the margins. While many argued that fully automatic parity changes within agreed upon limits would greatly improve the adjustment mechanism, others contended that some countries might find the system unacceptable because countries often regard control over their exchange rate as an established prerogative of national sovereignty. Too much fluctuation in the parity, even when a "correct" initial parity had been determined, might represent diminished control over domestic resources.

A suggested compromise (which retained most of the benefits of a discretionary or automatic crawling parity with widened exchange rate margins, while respecting concerns over national sovereignty) was a set of mutually agreed upon rules with some degree of multilateral surveillance. Such rules would be designed to guide the countries in establishing the margins and limiting the amount of governmental intervention (if any) within the widened margins.

Possible restrictions on domestic stabilization decisions — It was generally argued that gliding parities with widened margins permitted increased freedom for domestic interest rate policy. Stabilization authorities would have more freedom than with stable parities and very narrow margins to direct policies at domestic interest rates and economic conditions without encouraging short-term capital flows. Changes in the parities would mitigate the incentive for shifting interest-sensitive funds that might accompany shifts in domestic stabilization policy.

However, under certain conditions, crawling parities might tie domestic stabilization decisions just as closely to international conditions as throughout the 1960s. If, for example, a country's parity was highly predictable and it was widely believed that it would move downward at a maximum permitted annual rate of two per cent per annum for an extended period of time and its spot exchange rate would move down accordingly, domestic stabilization decisions would have to submit to the conditions of international trade, and domestic interest rates would have to be two per cent higher than foreign rates if there was to be no

capital outflow. As long as the direction of future parity and exchange rate movements was clear, expectations would give rise to the one-sided speculation which characterized most parity rate changes of major nations from 1967-70.

Ultimately, any restraint that might be placed on domestic economic policy decisions from the crawling parity had to be compared with the restraint that occurred when a parity was generally considered out of line, and when capital flows were consequently stimulated by the expectation of a large discrete adjustment in parities. Many observers believed at the end of the 1960s that once an appropriately aligned initial set of parities had been agreed upon, a system of crawling parities would help to maintain these relative currency values as international trade patterns shifted gradually over time, and thereby avoid substantial balance-of-payments disequilibria.

Alternative Solutions to the U.S. Balance-of-Payments Problem

There were three broad schools of thought on interpreting the meaning of U.S. balance-of-payments deficits in the late 1960s.⁴ The first emphasized the total supply of dollars available. As long as the supply at some given price was greater than the private demand, dollars would flow abroad through one channel or another and end up being acquired by foreign central banks. The only sure way to stop the deficit was to reduce the total supply of dollars relative to the demand for them, and the way to do this under a fixed exchange rate system was to maintain tight money.

The second school of thought insisted that a change in the price of dollars was required. The numerous *ad hoc* and direct measures already taken to cure surpluses and deficits such as border taxes, tariffs, and interest equalization taxes were ineffective and highly discriminatory means of reducing the deficit. What was needed was to remove these impediments to free trade and have a depreciation of the dollar relative to the currencies of the surplus countries.

In between the two extremes were those who said that the demand management approach was irrelevant because it failed to take into account the conflict between balance-of-payments and high-employment

⁴These positions are outlined in Cooper, "The Dollar and the World Economy," pp. 495-7, and Robert A. Mundell, *Monetary Theory: Inflation, Interest, and Growth in the World Economy* (Pacific Palisades, California: Goodyear, 1971), pp. 166-9.

objectives which often characterized the U.S. balance-of-payments problem. There were also those who pointed to the limited relevance of both the demand and supply approaches because of the difficulty of bringing general policy instruments to bear on the payments problem without damaging the domestic economy.

Many, but by no means all, interpreters of U.S. balance-of-payments performance found some common ground for agreement. They argued that piecemeal measures which had characterized balance-of-payments policies in the past should be abandoned because they were ineffective and discriminatory. They suggested that a viable alternative to previous balance-of-payments policies and continuous U.S. deficits was to set parity rates among industrial nations in such a way as to substantially reduce, but not eliminate the U.S. deficit, and to reduce the surpluses of many industrial nations. The realigned parity and exchange rate structure should assure that U.S. surpluses on current account were sufficient to nearly offset normal levels of unrestricted net private and Government investment abroad.

This position recognized that foreigners should no longer be forced to be unwilling holders of dollars, and that it was of critical importance to the Bretton Woods system to maintain confidence in the key currency. A means of restoring confidence was to reduce the deficit by parity rate adjustments. This position also recognized that there was unlikely to be any fundamental change in the role of the dollar in private international transactions in the early 1970s. As deficits

were reduced and adjustment improved in the Bretton Woods system, confidence in the dollar would be restored and the dollar would continue to be in wide demand as an international currency. Finally, supporters of this position recognized that a more flexible means of realigning parity rates in the future had to be coupled with other reforms, if there was to be a permanent and significant improvement in the U.S. balance-of-payments position and in international monetary arrangements.

EPILOGUE

This statement of the historical evolution of problems of the Bretton Woods system and some of the proposals offered for their resolution at the close of the 1960s is intended as background material for understanding negotiations about international monetary arrangements that have occurred in 1971 and 1972. There has already been some movement to achieve improved adjustment and liquidity performance of the Bretton Woods system, as is evidenced by a realignment of parities, a widening of margins around parities, and adoption and limited use of SDRs. The events of 1971 suggest, however, that the improvement came at the cost of disrupting international monetary order. Furthermore, the problem of the key currency country initiating changes in its own parity rate is likely to remain a critical one. It may well be that unless corrective action is taken in each of the problem areas of the Bretton Woods system, a "solution" to any individual problem may represent little permanent improvement.

